

DEPARTMENT OF THE INTERIOR  
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HON. THOMAS G. MURPHY, *Minister*

R. A. GIBSON, *Assistant Deputy Minister*

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BY

ERNEST A. HODGSON

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# Bibliography of Seismology

January, February, March, 1934

With this issue, a new volume of the PUBLICATIONS OF THE DOMINION OBSERVATORY is assigned to the *Bibliography of Seismology*. Volume X of the PUBLICATIONS, containing items 1-2000 and beginning with the issue for the first quarter of 1929, closes with the issue for the last quarter of 1933 and Volume XII begins with this, the issue for the first quarter of 1934. Preceding the bibliography of Vol X, an earlier series, compiled under the auspices of the Eastern Section of the Seismological Society of America, and covering a total of 1,200 items for the period 1926 to 1928, was published in the *Bulletin of the Seismological Society of America* (Vol. 17, Nos. 3 and 4, 1927; Vol. 18, Nos. 1, 2, 3, and 4, 1928; Vol. 19, No. 4, 1929; Stanford, Cal.). The history of the development of the *Bibliography of Seismology* is given in detail in an article entitled, "An Engineer's Library of Seismology" (*Bul. S.S.A.*, Vol. 21, No. 1, 51-52, 1931). The present editor is responsible for the entire compilation, old series and new.

The editor has been fortunate in having the continued and able assistance of collaborators in practically all the countries of the world in which seismological work is undertaken. Without such collaboration it would not be possible to cover, even approximately, the field which is ever widening. Publications of interest to seismologists, when reported to the Director of the Dominion Observatory, Ottawa, by their authors or by collaborators, are listed at once in the current manuscript of the *Bibliography*. The manuscript for any issue is closed about the mid-date of the period nominally covered by that issue.

It is hoped that the list of those regularly collaborating in this work may continue to grow. To this end, convenient report forms have been prepared, a supply of which will be sent to anyone interested, on application to the Director, Dominion Observatory. The use of the form reduces the work of a collaborator to a minimum and insures the complete listing of the publication details.

Beginning with the present issue names of publication media will be abbreviated. A list of typical abbreviations follows:

## ABRIDGED LIST OF ABBREVIATIONS

Académie des Sciences de l'Union des Républiques Soviétiques Socialistes; Leningrad ..... Acad. Sc. URSS.	Annals of the Smithsonian Institution; Washington... Ann. Smith. Inst.
American Geophysical Union; Washington... A.G.U.	Annotated Bibliography of Economic Geology; Washington... Ann. Bib. Econ. Geol.
American Institute of Mining and Metallurgical Engineers, Technical Publication; New York ..... A.I.M.M.E., Tech. Pub.	Annual Report of the Smithsonian Institution; Washington... Ann. Rep. Smith. Inst.
American Journal of Science; New Haven ..... Amer. J. Sc.	Asociación Española para el Progreso de las Ciencias; Madrid... Assoc. Esp. Prog. Cien.
Annalen der Physik; Leipzig... Ann. Phys.	Associated Factory Mutual Fire Insurance Companies; Boston... A.F.M.F.I.C.
Annalen der Schweizerischen Meteorologischen Zentralanstalt; Zürich... Ann. Schweiz. Met. Zent.	Astronomische Nachrichten; Hamburg... Ast. Nach.
Annales de l'Institut de Physique du Globe de l'Université de Paris et du Bureau Central de Magnétisme Terrestre; Paris... Ann. Inst. Phys. Gl., Univ. Paris	Beiträge zur Angewandten Geophysik; Leipzig... Bei. Angew. Geoph.
Annals of the Association of American Geographers... Ann. Ass. Amer. Geog.	Beiträge zur Physikalischen Erforschung der Erdrinde; Berlin... Bei. Phys. Erfor. Erdrinde
Annals of the Crimean Scientific Research Institute; Simpheropol... Ann. Crimean Sc. Res. Inst.	Bergens Museums Årbok, Naturvidenskapelig rekke... Bergens Mus. Årbok, Natur.
	Bericht der Erdbebenwarte des Geophysikalischen Instituts der Universität Leipzig; Leipzig... Ber. Erd. Geoph. Inst., Univ. Leipzig

ABRIDGED LIST OF ABBREVIATIONS—*Continued*

- Berichte der Mathematisch-physikalischen Klasse der Sächsischen Akademie der Wissenschaften zu Leipzig; Leipzig. . . . . Ber. M-p. Kl. Säch. Akad. Wiss. Leipzig
- Boletín del Servicio Sismológico de la Universidad de Chile; Santiago. . . . . Bol. Sis. Univ. Chile
- Bollettino del Comitato Nazionale Italiano per la Geodesia e la Geofisica; Rome. . . . . Bol. Com. Naz. Ital. Geod. Geof.
- Bollettino della Società Sismologica Italiana; Rome. . . . . Bol. Soc. Sis. Ital.
- British Association for the Advancement of Science. . . . . Brit. Ass.
- Bulletin of the Société des Naturalistes de Moscou; Moscow. . . . . Bul. Soc. Nat. Moscou
- Bulletin de la Société Neuchateloise des Sciences Naturelles; Neuchatel. . . . . Bul. Soc. Neuch. Sc. Nat.
- Bulletin of Saint Louis University; Saint Louis. . . . . Bul. Saint Louis Univ.
- Bulletin of the American Association of Jesuit Scientists, Eastern Section; Baltimore. . . . . Bul. Amer. Ass. Jesuit Sc., E.S.
- Bulletin of the American Association of Petroleum Geologists; Tulsa. . . . . Bul. Amer. Ass. Pet. Geol.
- Bulletin of the Earthquake Research Institute, Tokyo Imperial University; Tokyo. . . . . Bul. Eq. Res. Inst.
- Bulletin of the Geological and Prospecting Service of the USSR.; Moscow-Leningrad. . . . . Bul. Geol. Pros. Ser. USSR.
- Bulletin of the Geological Society of America; Washington. . . . . Bul. Geol. Soc. Amer.
- Bulletin of the Imperial Earthquake Investigation Committee; Tokyo. . . . . Bul. Imp. Eq. Inves. Com.
- Bulletin of the Seismological Society of America; Stanford. . . . . Bul. S.S.A.
- Bureau of Standards, Journal of Research; Washington. . . . . Bur. Stand. Jour. Res.
- Bureau of Standards Miscellaneous Publications; Washington. . . . . Bur. Stand. Misc. Pub.
- Canadian Mining and Metallurgy Bulletin; Montreal. . . . . Can. Min. Metal. Bul.
- Carnegie Institution of Washington, Year Book; Washington. . . . . Car. Inst. Wash., Year Book
- Comité National du Royaume des Serbes, Croates, et Slovènes (Union Géodésique et Géophysique Internationale), Section de Séismologie; Belgrade. . . . . Com. Nat. R. Serbes, Croates, et Slovenes, U.G.G.I., Sec. Séis.
- Comptes Rendus, Comité National Français de Géodésie et Géophysique; Paris. . . . . C.R. Com. Nat. Fran. Géod. Géoph.
- Comptes Rendus des Congrès de l'Association Française pour l'Avancement des Sciences. . . . . C.R. Cong. Ass. Fran. Adv. Sc.
- Comptes Rendus du Congrès des Sociétés Savantes. . . . . C.R. Cong. Soc. Sav.
- Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences; Paris. . . . . C.R.
- Contributions from the Department of Geology and Mineralogy, University of Manitoba; Winnipeg. . . . . Cont. Dept. Geol. Min., Univ. Man.
- Deutsche Rundschau; Berlin. . . . . Deut. Rund.
- Dirección General del Instituto Geográfico, Cadas-tral y de Estadística; Madrid. . . . . Dir. Gen. Inst. Geog. Cad. Estad.
- Dominion Observatory (New Zealand) Bulletins; Wellington. . . . . Dom. Obs. (N.Z.) Bul.
- Earthquake Notes, Publication of the Eastern Section of the Seismological Society of America; Washington. . . . . Eq. Notes
- Eastern Section of the Seismological Society of America; Washington. . . . . E.S., S.S.A.
- Economic Geology; Tulsa. . . . . Econ. Geol.
- Engineering and Mining Journal; New York. . . . . Eng. Min. Jour.
- Engineering News-Record; New York. . . . . Eng. N-R.
- English Mechanics; London. . . . . Eng. Mech.
- Feinmechanik und Präzision. . . . . Feinmech.
- Geofysiske Publikasjoner, utgitt av det Norske Videnskaps-Akademi i Oslo; Oslo. . . . . Geof. Pub. Akad. Oslo
- (The) Geographical Journal; London. . . . . Geog. Jour.
- (The) Geological Magazine; London. . . . . Geol. Mag.
- Geographical Review; New York. . . . . Geog. Rev.
- Geologische Rundschau; Berlin. . . . . Geol. Rund.
- Geologisches Zentralblatt; Berlin. . . . . Geol. Zent.
- Geophysical Abstracts, United States Bureau of Mines; Washington. . . . . Geoph. Abs.
- Geophysical Laboratory, Saint Louis University; Saint Louis. . . . . Geoph. Lab., Saint Louis Univ.
- Geophysical Magazine, Central Meteorological Observatory; Tokyo. . . . . Geoph. Mag.
- Geophysical News and Review of Geophysical Literature, Colorado School of Mines Publication; Golden. . . . . Geoph. News and Rev. Geoph. Lit.
- Gerlands Beiträge zur Geophysik; Leipzig. . . . . Ger. Bei.
- Gerlands Beiträge zur Geophysik, Ergänzung-shefte für Angewandte Geophysik; Leipzig. . . . . Ger. Bei., Ergänz.
- Handelingen van het negende Nederlandsch Natuur- en Geneeskundig Congres. . . . . Hand. Neder. Nat.-Genee. Cong.
- Information Bulletin, Académie des Sciences, URSS.; Leningrad. . . . . Inf. Bul., Acad. Sc. URSS.
- Instituto Geologico de Mexico; Mexico. . . . . Inst. Geol. Mexico
- International Seismological Summary; Oxford. . . . . Int. Seis. Sum.
- International Union of Geodesy and Geophysics. . . . . I.U.G.G.
- Jaarboek van het Mijnwezen in Nederlandsch Oost-Indië; Batavia. . . . . Jaar. Mijn. O-Ind.
- Jaarverslag van het Geologisch Bureau voor het Nederlandsche Mijngedebied; Heerlen. . . . . Jaar. Geol. Bur. Neder. Mijn.
- Jahrbuch der Preussischen Geologischen Landes-anstalt; Berlin. . . . . Jahr. Preus. Geol. Land.
- Jahresbericht der Physikalischen Vereins zu Frank-furt am Main; Frankfurt a.M. . . . . Jahr. Phys. Ver., Frankfurt a.M.



ABRIDGED LIST OF ABBREVIATIONS—*Continued*

- Jahresbericht des Schweizerischen Erdbebendienstes; Zürich. . . . .Jahr. Schweiz. Erd.
- Japanese Journal of Astronomy and Geophysics; Tokyo. . . . .Jap. Jour. Ast. Geoph.
- Japanese Journal of Geology and Geography; Tokyo. . . . .Jap. Jour. Geol. Geog.
- Journal de Physique et le Radium; Paris. . . . .Jour. Phys. Rad.
- Journal of Applied Physics. . . . .Jour. App. Phys.
- Journal of Geology; Chicago. . . . .Jour. Geol.
- Journal of Geophysics and Meteorology; Leningrad. . . . .Jour. Geoph. Met.
- Journal of Scientific Instruments; London. . .J.S.I.
- Journal of the British Astronomical Association; London. . . . .Jour. Brit. Ast. Ass.
- Journal of the Faculty of Science, Tokyo Imperial University; Tokyo. . . . .Jour. Fac. Sc., Tokyo Imp. Univ.
- Journal of the Franklin Institute; Philadelphia. . . . .Jour. Frank. Inst.
- Journal of the Institute of Electrical Engineers; London. . . . .Jour. Inst. Elec. Eng.
- Journal of the Institution of Petroleum Technologists; London. . . . .Jour. Inst. Pet. Tech.
- Journal of the Royal Astronomical Society of Canada; Toronto. . . . .J.R.A.S.C.
- Journal of the Washington Academy of Science; Washington. . . . .Jour. Wash. Acad. Sc.
- Koninklijke Akademie van Wetenschappen te Amsterdam; Amsterdam. . . . .K. Akad. Weten. Amsterdam
- Koninklijk Magnetisch en Meteorologisch Observatorium te Batavia; Batavia. . . . .K. Mag. Met. Obs. Batavia
- Koninklijk Nederlandsch Meteorologisch Instituut, Publications; De Bilt. . . . .K. Neder. Met. Inst. Pub.
- Lehigh University Publications, Institute of Research Circular; Bethlehem, Pa. . . . .Lehigh Univ. Pub., Inst. Res. Cir.
- Manila Central Observatory, Seismological Bulletin; Manila. . . . .Manila Cent. Obs. Seis. Bul.
- Matériaux pour l'Étude des Calamités; Geneva. . . . .Mat. E. Cal.
- Memoirs of the College of Science and Engineering, Kyoto Imperial University; Kyoto. . . . .Mem. Col. Sc. Eng., Kyoto Imp. Univ.
- Memoirs of the Imperial Marine Observatory; Kobe. . . . .Mem. Imp. Mar. Obs.
- Memorias de la Real Sociedad Española de Historia Natural; Madrid. . . . .Mem. R. Soc. Esp. Hist. Nat.
- Memorie del Reale Ufficio Centrale di Meteorologia e Geofisica; Rome. . . . .Mem. R. Uff. Cent. Met. Geof.
- Meteorolog-geophysikalische Abteilung des Württembergischen Statistischen Landesamts; Stuttgart. . . . .M-g. Ab. Württ. Stat. Land.
- Mines Magazine, Colorado School of Mines; Golden. . . . .Mines Mag.
- Mitteilungen aus dem Laboratorium für Technische Physik, der Technischen Hochschule, München; München. . . . .Mitt. Lab. Tech. Physik., München
- Mitteilungen der Geophysikalischen Warte Gr. Raum der Albertus-Universität, Königsberg i. Pr.; Königsberg. . . . .Mitt. Geoph. Warte Gr. Raum, Univ. Königsberg
- Monthly Notices of the Royal Astronomical Society, Geophysical Supplement; London. . . . .M. N., Geoph. Sup.
- Nachrichten der Gesellschaft der Wissenschaften zu Göttingen, Mathematisch-physikalische Klasse; Göttingen. . . . .Nach. Ges. Wiss. Gött., M-p. Kl.
- National Research Council (United States); Washington. . . . .N.R.C. (U.S.)
- Natuurkundige Voordrachten gehouden in de Maatschappij Diligentia; The Hague. . . . .Natuur. Voor. Maat. Dil.
- Natuurkundig Tijdschrift voor Nederlandsch-Indië; Weltevreden (Isle of Java). . . . .Natuur. Tijd.
- New Zealand Journal of Science and Technology; Wellington. . . . .N.Z. J. Sc. Tech.
- New Zealand National Review. . . . .N.Z. Nat. Rev.
- (The) New Zealand Official Year Book; Wellington. . . . .N.Z. Year Book
- Notes de Séismologie, Observatoire de Zi-Ka-Wei. . . . .Notes Séis., Zi-Ka-Wei
- Observatorio Astronómico de la Universidad Nacional de La Plata; Contribuciones Geofísicas; La Plata. . . . .Obs. Ast. Univ. Nac. La Plata, Cont. Geof.
- Pan-American Geologist; Des Moines. . . . .Pan-Amer. Geol.
- Papers from the Geophysical Laboratory, Carnegie Institution of Washington; Washington. . . . .Papers Geoph. Lab., Car. Inst. Wash.
- Petermanns Mitteilungen; Gotha. . . . .Peter. Mitt.
- (The) Petroleum Times; London. . . . .Pet. Times
- (The London, Edinburgh and Dublin) Philosophical Magazine and Journal of Science; London. . . . .Phil. Mag.
- Philosophical Transactions of the Royal Society of London; London. . . . .Phil. Trans. R. Soc.
- Physical Review; New York. . . . .Phys. Rev.
- Physikalische Berichte; Braunschweig. . . . .Phys. Ber.
- Physikalische Zeitschrift; Leipzig. . . . .Phys. Zeit.
- Pontificia Accademia delle Scienze Nuovi Lincei; Rome. . . . .Pont. Accad. Sc. Lincei
- Proceedings of the American Society of Civil Engineers; New York. . . . .Proc. Amer. Soc. C.E.
- Proceedings of the London Mathematical Society; London. . . . .Proc. London Math. Soc.
- Proceedings of the National Academy of Sciences; Washington. . . . .Proc. Nat. Acad. Sc.
- Proceedings of the Pan Pacific Science Congress; . . . . .Proc. Pan Pac. Sc. Cong.
- Proceedings of the Physical Society; London. . . . .Proc. Phys. Soc.
- Proceedings of the Physico-Mathematical Society of Japan; Tokyo. . . . .Proc. P-M. Soc. Jap.

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- Proceedings of the Royal Society; London... .. Proc. R.S.  
 Proceedings of the Section of Seismology of the International Union of Geodesy and Geophysics... .. Proc. Sec. Seis., I.U.G.G.  
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 Quarterly Journal of the Royal Meteorological Society; London... .. Quar. J. R. Met. Soc.  
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 (La) Ricerca Scientifica, nel Bollettino di Geodesia e Geofisica; Rome... .. Ric. Sc., Bol. Geod. Geof.  
 Royal Society of Edinburgh; Edinburgh... .. R. Soc. Edin.  
 Sächsischen Akademie der Wissenschaften zu Leipzig, Mathematisch-physikalische Klasse; Leipzig... .. Säch. Akad. Wiss. Leipzig, M-p. Kl.  
 Schriften der Physikalisch-ökonomischen Gesellschaft zu Königsberg i. Pr.; Königsberg... .. Sch. Phys.-ökon. Ges. Königsberg  
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 Science News-Letter; Washington... .. Sc. N.-L.  
 Science Reports, Tohoku Imperial University; Sendai... .. Sc. Rep., Tohoku Imp. Univ.  
 Science Service; Washington... .. Sc. Ser.  
 Seismische Berichte der Württembergischen Erdbenenwarten; Stuttgart... .. Seis. Ber. Württ. Erd.  
 Seismische Berichte des Taunus-Observatoriums; Frankfurt a.M... .. Seis. Ber. Taunus  
 Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen; Braunschweig... .. Seis. Unter. Geoph. Inst. Gött.  
 Seismological Society of America... .. S.S.A.  
 Senckenbergische Naturforschende Gesellschaft; Frankfurt a.M... .. Sencken. Natur. Ges.  
 Sitzungsberichte der Naturforscher-Gesellschaft; Dorpat... .. Sitz. Natur. Ges.  
 Société Française de Physique, Section de Strasbourg; Strasbourg... .. Soc. Fran. Phys. Sec. Strasbourg  
 Sveriges Geologiska Undersökning, Årsbok; Stockholm... .. Sver. Geol. Under, Årsbok  
 Technological Reports, Tohoku University; Sendai... .. Tech. Rep., Tohoku Univ.  
 (The) Technology Review; Cambridge, Mass... .. Tech. Rev.  
 Terrestrial Magnetism and Atmospheric Electricity; Baltimore... .. Ter. Mag. At. Elec.  
 Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap; Leiden... .. Tijd. K. Neder. Aard. Genoot.  
 Tijdschrift voor het Onderwijs in de Aardrijkskunde; Amsterdam... .. Tijd. Onder. Aard.  
 Transactions of the American Geophysical Union, Annual Meeting; Washington... .. Trans. A.G.U., Ann. Mtg.  
 Transactions of the American Institute of Mining and Metallurgical Engineers; New York... .. Trans. Amer. Inst. Min. Met. Eng.  
 Transactions of the Royal Society of Canada; Ottawa... .. Trans. R.S.C.  
 Transactions of the United Geological and Prospecting Service of the USSR; Leningrad... .. Trans. Geol. Pros. Ser. USSR.  
 Tycos: Publication of the Taylor Instrument Company; Rochester... .. Tycos  
 Union Géodésique et Géophysique Internationale... .. U.G.G.I.  
 United States Bureau of Mines; Washington... .. U.S. Bur. Mines  
 United States Coast and Geodetic Survey; Washington... .. U.S.C.G.S.  
 United States Department of Commerce; Washington... .. U.S. Dept. Com.  
 United States Patent Office; Washington... .. U.S. Pat. Off.  
 University of California, Publications in Geography; Berkeley... .. Univ. Cal. Pub. Geog.  
 University of Texas, Contributions to Geology; Austin... .. Univ. Texas, Cont. Geol.  
 Verhandelingen Tweede Nederlandsch-Indisch Natuurwetenschappelijk Congres... .. Verhand. Tweede Neder. Natuur. Cong.  
 Verhandelingen van den Koninklijke Akademie van Wetenschappen; Amsterdam... .. Verhand. K. Akad. Weten.  
 Verhandlungen der Deutschen Physikalischen Gesellschaft; Braunschweig... .. Verhand. Deut. Phys. Ges.  
 Verhandlungen des Naturwissenschaften Vereins zu Hamburg; Hamburg... .. Verhand. Natur. Ver. Hamburg  
 Veröffentlichungen der Reichsanstalt für Erdbenenforschung in Jena; Leipzig... .. Veröff. Jena  
 Veröffentlichungen des Preussischen Geodatischen Instituts; Potsdam... .. Veröff. Pr. Geod. Inst.

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Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich; Zürich.. . . . .	Zeitschrift für den Physikalischen und Chemischen Unterricht; Berlin.. . . . .
.. . . . . Viertel. Natur. Ges. Zürich	.. . . . . Zeit. Phys. Chem. Unter.
(The) Volcano Letter; Honolulu.. . . . .	Zeitschrift für Geophysik; Braunschweig.. . . . .
.. . . . . Vol. Let.	.. . . . . Zeit. Geoph.
Vulkanologische en Seismologische Mededeelingen van den Dienst van den Mijnbouw in Nederlandsch-Indië; Weltevreden (Isle of Java) .. . . . .	Zeitschrift für Instrumentenkunde; Berlin.. . . . .
.. . . . . Vul. Seis. Med. Neder-Ind.	.. . . . . Zeit. Inst.
Zeitschrift der Deutschen Geologischen Gesellschaft; Berlin.. . . . .	Zeitschrift für Praktische Geologie; Halle.. . . . .
.. . . . . Zeit. Deut. Geol. Ges.	.. . . . . Zeit. Prak. Geol.
Zeitschrift für Angewandte Mathematik und Mechanik; Berlin.. . . . .	Zeitschrift für Technische Physik; Leipzig.. . . . .
.. . . . . Zeit. Angew. Math. Mech.	.. . . . . Zeit. Tech. Phys.
	Zeitschrift für Vulkanologie; Berlin.. . . . .
	.. . . . . Zeit. Vulkan.

2001. ACKERL, F., "Die Ergebnisse der Entwicklung des Schwerkraftfeldes der Erde nach Kugelfunktionen bis zur 16. Ordnung," *Zeit. Geoph.*, Jahr, 9, 263-275, 3 tables, Braunschweig, 1933.

2002. ADAMS, C. E., "Report of the Dominion Astronomer and Seismologist for the year ended 31st December, 1930," and a report of similar nature for the year ended 31st December, 1931. These are extracts of, respectively, 7 and 8 pages from the corresponding annual reports of the Department of Scientific and Industrial Research, New Zealand. Both were distributed in 1933. Information of considerable interest and value with regard to seismic conditions in New Zealand is included in each.

2003. ADAMS, C. E. *et al.*,

(1) "Seismology in New Zealand," *Dom. Obs. (N.Z.) Bul.*, No. 84, 8 pp., 1 map, Wellington, 1933. Issued with the collaboration of Dr. J. Henderson of the Geological Survey. (Extract from *N.Z. Year Book 1933.*)

(2) "Seismology in New Zealand," *Ibid.*, No. 90, 4 pp., Wellington, 1933. (Extract from *N.Z. Year Book 1934.*)

(3) "Seismological Report of the Hawke's Bay Earthquake of 3rd February, 1931," *Ibid.*, No. 85, 16 pp., 7 fig., Wellington, 1933. (With the collaboration of M. A. F. Barnett and R. C. Hayes.)

2004. AGAMENNONE, G., "Elenco dei soci e costituzione del Direttore Provvisorio della Società Sismologica Italiana," *Bol. Soc. Sis. Ital.*, Vol. 31, Fasc. 1-2, 12 pp. in reprint, Rome, 1933. G.A.

2005. AMBRONN, Richard, "A new Shock Measurer for Seismic Acceleration Curves," *Pet. Times*, No. 758, Vol. 30, 132, London, 1933.

The abstract only is given in the above publication. It reads as follows: "It is first shown why seismographs, which record the acceleration of the ground, are particularly suited to prospecting work. Instruments which utilize the piezo-electric properties of certain crystals prove specially useful for exactly recording the acceleration curves, on account of the suppression of the natural vibrations and damping arrangements. Several types of a seismograph constructed on this principle are described and explained by illustration." F.W.L.

— ANDERSON, J. A., "Principle of the Seismograph." Chapter 15, pp. 137-153 of the *Bulletin on Seismology* issued by the National Research Council, U.S.A., and reported as No. 2076 of this list.



2006. ANDRÉE, K., "Die Geophysikalische Warte der Albertus-Universität, ihre Aufgaben and ihre bisherigen Arbeiten," *Ostdeutschen Naturwart*, Bd. 4, Heft 5, 6 pp. in reprint, Liegnitz, Sept., 1933.
2007. ANGENHEISTER, G., "Seismische Methoden zur Erforschung des Aufbaues der Grossformen der Erde," *Jahr. Phys. Ver., Frankfurt a.M. (1932-1933)*, 30-33, Frankfurt a.M., 1933. R.Z.
2008. ARAKAWA, H., "Generalized Green's Law on Wave Motion in a Canal of Variable Section," *Geoph. Mag.*, Vol. 7, No. 3-4, 319-325, 7 fig., Tokyo, Nov., 1933.
2009. ASSOCIATED FACTORY MUTUAL FIRE INSURANCE COMPANIES, "Construction." Booklet of 53 pages, 35 figures, dealing with building construction to resist fire and also (pp. 49-53) wind and earthquakes. Price 20 cents. May be obtained through the Arkwright Office, Factory Mutual Insurance, 185 Franklin St., Boston, Mass., U.S.A. C.G.R.
- BARNETT, M. A. F., "Seismological Report of the Hawke's Bay Earthquake of 3rd February, 1931." See No. 2003 (3) of this list.
2010. BASCHIN Otto, "Bekämpfung von Erdbeben: Lehren einer grossen Natur-Katastrophe," *Deut. Rund.*, Bd. 60, 47-51, Berlin, Oct., 1933. H.T.G.  
The article is a general discussion of the nature and effects of earthquakes, their causes and their habit of recurrence. The illustrations are mostly taken in the case of earthquakes in Japan though there is some reference to earthquake epicentres in California.
2011. BASTINGS, L., "Some Seismological Aspects of the Buller Earthquake, 1929, June 16-17," *N.Z.J. Sc. Tech.*, Vol. 15, No. 2, 128 *et seq.*, Wellington, Sept., 1933.  
Records from stations in the nearer hemisphere indicate that the earthquake had a triple focus, with shocks in dynamical connection. The energy of the third and main disturbance is estimated at about  $10^{24}$  ergs. Travel times for *P* and *S* agree reasonably well with Jeffrey's recent tables, but are distinctly longer in the neighbourhood of  $20^\circ$ .  
A paper by the same author and with the same title appears as *Bulletin No. 86* of the publications of the Dominion Observatory, Wellington, New Zealand. The paper appears as a separate of 15 pp., 3 fig., 3 tables. The place and date of publication are, respectively, Wellington, 1933. L.B.
2012. BEARDSLEY, R., "Le tremblement de terre de California du 10 mars 1933," *Astronomie*, T. 47, No. 10, 474, Paris, Oct., 1933.  
An account by a resident of Los Angeles who experienced the earthquake. Three photographs of damaged structures. J.C.
2013. BEBB, A. H., "On the Suppression of Harmonics of the Einthoven String Galvanometer," *J. S. I.*, Vol. 10, No. 11, 362-364, 4 fig., London, Nov., 1933.
2014. BENNDORF, HANS, "Über die Art der Fortpflanzung der Erdbebenwellen im Erdinnern," *Mitt. Erd.-Komm. K. Akad. Wiss. Wien*, N. F., No. 29, Wien, 1905 and No. 30, Wien, 1906.  
The first communication occupies 24 pages in the reprint, having 3 figures and numerous tables. The second communication occupies 42 pages in the reprint, having 9 figures and 5 tables. The above is the classic contribution of Benndorf to the problem of the propagation of earthquake waves in the earth.

2015. BERGER, R. and JUNG, K., "Seismometrische Beobachtungen in Potsdam in der Zeit vom 1. Januar 1929 bis 31. Dezember 1932," *Veröff. Pr. Geod. Inst.*, 1-61, Potsdam, 1933.
2016. BILLINGS, Marland, "Thrusting Younger Rocks over Older," *Amer. J. Sc.*, Fifth Ser., No. 146, Vol. 35, 140-165, 13 fig., bib., New Haven, 1933.
2017. BODLE, Ralph R. *et al.*, "Earthquake Notes." Pub. E. S., S. S. A., Vol. 5, No. 3, 8 pp., Washington, Dec., 1933.

The issue contains many items of interest to seismologists and two short papers by James B. Macelwane, S.J., entitled: "The Lisbon Meeting," and "Grover, Missouri, Earthquake of November 16, 1933."

The publication is edited by Ralph R. Bodle U.S. Coast and Geodetic Survey, Washington, D.C., U.S.A. Items of interest to members of the Eastern Section should be forwarded to him at that address for publication in *Earthquake Notes*.

2018. BOWIE, William, "Geodetic Operations in the United States, 1930-1932," U.S. Dept. Com., C.G.S., Spec. Pub. No. 178, 25 pp., 3 fig., Washington, 1933.

The above constitutes the report of the Coast and Geodetic Survey to the International Association of Geodesy of the International Union of Geodesy and Geophysics, International Council of Scientific Unions. On page 9 is given a short report on the special geodetic work in California, carried out for the purpose of affording quantitative measures of earthquake and slow creep displacements.

- BRAZIER, C. E. and MAURAIN, Ch., "Sur le tremblement de terre du 3 octobre 1933." See No. 2079 of this list.

2019. BULLEN, K. E., "On the Errors in Calculations of Epicentral Distances in Earthquakes," *M.N., Geoph. Sup.*, Vol. 3, No. 5, 190-201, London, Jan., 1934.

- BULLEN, K. E. and JEFFREYS, Harold, "Final Tables." See No. 2061 of this list.

- BYERLY, P. The *Bulletin on Seismology*, issued recently by the National Research Council, U.S.A., and reported as No. 2076 of this list, contains the following chapters by Dr. Byerly:

Chap. 16. "Analysis of Seismograms of Near Earthquakes," pp. 154-170.

Chap. 17. "Records of Earthquakes at Intermediate and Great Distances," pp. 171-188.

Chap. 18. "Time-Distance Curves," pp. 189-197.

Chap. 19. "Reduction of Trace Amplitudes," pp. 198-205.

Chap. 20. "Seismic Geography," pp. 206-215.

2020. CAPPA, F. X., "A Laboratory on Wheels," *Mines Mag.*, Vol. 22, No. 9, p. 24, Golden, Sept. 24, 1932.

A short article showing two pictures of a Colorado School of Mines seismic reflection equipment and relating the history of its development by members of the geophysics department.

2021. COLEMAN, A. P., "Ice Ages and the Drift of Continents," *J. Geol.*, Vol. 41, No. 4, 409-417, Chicago, May-June, 1933.

The author's abstract reads: "The theory of the 'drift of continents' proposed by the late Dr. Wegener was supposed to account readily for the Pleistocene and the Permo-Carboniferous ice ages, and this was considered one of the most important proofs of its validity. In the following paper it is shown that his theory fails completely in this respect, and it is considered that the fixity of the continents is the more reasonable supposition."

2022. CONRAD, V., "Die zeitliche Folge von Beben mit tiefem Herd," *Ger. Bei.*, Bd. 40, Heft 2-3, 113-133, 3 fig., 10 tables, Leipzig, 1933.

The author found no correlation between moon influences and the time of occurrence of deep-focus earthquakes. There is some indication of a yearly cycle calculated on the basis of monthly frequencies, and other periods of less than a year which promise to be established on the basis of a study of a larger amount of statistical material. The author believes that such a study will establish the rotation of the pole as one of the causes of both deep and shallow focus earthquakes.

2023. CONROY, Charles C., "Earthquake Weather," *Typos*, Vol. 23, No. 3-4, 106-108, Rochester, 1933.

2024. CRITIKOS, M. N., "Sur le séismicité de Macédoine," *Ger. Bei.*, Bd. 40, Heft 4, 371-379, 3 maps, Leipzig, 1933.

2025. DAHM, Cornelius G., "Epicenter of the Hawke Bay (New Zealand) Earthquake and Travel-times of Condensational Waves," *Bul. S.S.A.*, Vol. 23, No. 4, 139-157, 10 fig., 6 tables, bib., Stanford, Oct., 1933. C.G.D.

2026. DAVIS, W. M., "The Long Beach Earthquake," *Geog. Rev.*, Vol. 24, No. 1, 1-11, 6 illus., New York, Jan., 1934. R.R.B.

The paper deals with the subject under the following headings: Geological Relations; Report of the Committee on Earthquake Protection; Damage to Property; Earthquake-Resistant Construction; Report of the National Board of Fire Underwriters; Effects on the Tourist Industry.

2027. DAVISON, Charles, "Scales of Seismic Intensity: Supplementary Paper," *Bul. S.S.A.*, Vol. 23, No. 4, 158-166, Stanford, Oct., 1933.

The earlier paper appeared in the same publication (Vol. 11, 95-129, 1921). The combined papers constitute a most complete treatment of the subject.

2028. DELURY, J. S., "The Strength of the Earth," *J. Geol.*, Vol. 41, No. 7, 748-756, 2 fig., Chicago, Oct.-Nov., 1933.

The author's abstract reads: "A consideration of sources of local heat in crust and subcrust and a recognition of the significance of horizontal variations in geothermal gradients, and consequent irregularities of shallow geoisotherms, together lead directly to the interpretations that the levels of magma formation are relatively shallow, and that in the levels of smoothly concentric geoisotherms (beneath the influence of shallow sources of heat), temperatures are so low that other factors decree a strength too great to permit a continuous zone of weakness for isostatic adjustment. The conception of the asthenosphere is criticized on other grounds and a mechanism is provided for disturbing, as well as for correcting, the isostatic balance." J.S.DeL.



2029. EARTHQUAKE RESEARCH INSTITUTE, "Seismometrical Report, Part I, 1933, January 1-March 31," *Eq. Res. Inst.*, 7 pp., 7 pl., Tokyo, 1933.
- The report deals first with "Sensible Earthquakes in Tokyo" for the period under discussion. It then discusses "The Earthquake and the Seismic Sea-wave (Tsunami) of Northeast Japan, March 3, 1933." Each of these sections is illustrated by a map in addition to the plates mentioned above.
2030. EISENHOUR, B. E. and TYZZER, F. G., "Elastic Properties of Various Materials and Their Effect on the Transmission of Vibrations," *J. Frank. Inst.*, Vol. 214, No. 6, 691-707, Philadelphia, 1932. W.W.D.
2031. ENGINEERING NEWS-RECORD, "A Word of Caution," *Eng. N.-R.*, Vol. 112, No. 3, p. 92, New York, Jan. 18, 1934. R.R.B.
2032. FRAZER, Calvin, "What is a Tidal Wave?" *Tycos*, Vol. 23, Nos. 3-4, 91-92, 8 illus., Rochester, July-Oct., 1933.
2033. FRYXELL, Fritiof, "Earthquake Shocks in Jackson Hole, Wyoming," *Bul. S.S.A.*, Vol. 23, No. 4, 167-168, Stanford, Oct., 1933.
2034. FUJIWHARA, S., "On Spiral Cracks of Fuzi (Fuji) Volcano," *Geoph. Mag.*, Vol. 7, No. 2, 207-224, 6 fig., Tokyo, 1933. S.F.
2035. FUKUTOMI, Takaharu, "Some Statistical Problems Concerning Initial Earthquake Motion. (The First Report)," *Bul. Eq. Res. Inst.*, Vol. 11, Part 3, 510-529, 9 fig., 3 tables, Tokyo, Sept., 1933.
2036. GALES, B. G., "A New Harmonic Analyser," *J. S. I.*, Vol. 9, No. 12, 380-386, London, 1932. W.W.D.
2037. GAUDEY, R. F., "Treatment of Water Supply after Long Beach Earthquake," *Eng. N.-R.*, Vol. 111, No. 17, 502-503, New York, Oct. 26, 1933.
2038. GILLIGAN, Albert, "A Contribution to the Geological History of the North Atlantic Region," *Ann. Rep. Smith. Inst.*, 1932, Pub. No. 3185, 207-222, bib., Washington, 1933.
2039. GOLDSTONE, F., "Mapping of Geological Structure by the Reflection of Elastic Waves," *Pet. Times*, No. 756, Vol. 30, p. 30, London, 1933.

The following abstract by Ayvazoglou is given in *Geoph. Abs.* No. 55, 962-963 (see No. 2071 of this list): "According to the abstract of Goldstone's paper given in this number of *The Petroleum Times*, the author describes the utilization of the reflected elastic waves in structure mapping. The usual field procedure is discussed and examples of typical seismograms permitting mapping by correlation are reproduced. The results of such a survey in Oklahoma are given. Examples of typical seismograms from which interpretation must be derived by the dip method are reproduced and the graphical method of obtaining the reflecting plane is explained. The conclusion is drawn that many structural problems confronting the petroleum geologist can be solved by the two methods of reflection shooting outlined in the article." F.W.L.

2040. GROUBÉ, W., "Les tremblements de terre au Maroc en juillet et août 1933," *L'Astronomie*, Vol. 47, No. 10, 480, Paris, Oct., 1933.

A summary description of two earthquakes.

J.C.

2041. GUTENBERG, B., "Über Erdbeben mit Herdtiefen von mehreren hundert Kilometern," *Geol. Rund.*, Bd. 24, Heft 3-4, 229-239, 5 fig., bib., Berlin, 1933.

2042. GUTENBERG, B., "Erde," *Handwörterbuch der Naturwissenschaften, Zweite Auflage*, Gustav Fischer, 762-774, 10 fig., Jena, 1933.

This publication is appearing in sections (Lieferungen und Bände). There will be about 95 Lieferungen, each of about 128 pages. Each will cost RM6. A total of 10 Bände is planned. The publishers have ready for distribution a folder giving full details of the work.

The section reported above as the work of Dr. Gutenberg deals with the following subject matter: The structure of the earth; Density and mass of the earth; Pressure in the interior; Gravity, etc.; Rigidity in the earth's interior; Compressibility in the earth's interior; Internal friction in the earth's interior; Viscosity in the deep interior; Temperature; Earth forces; Movements of parts of the earth body.

2043. GUTENBERG, B. and RICHTER, C. F., "Advantages of Using Geocentric Latitude in Calculating Distances," *Ger. Bei.*, Bd. 40, Heft 4, 380-389, 1 fig., 3 tables, Leipzig, 1933.

2044. HAMMILL, Harold B., "Earthquake Design for an Eight-story Apartment House," *Eng. N.-R.*, Vol. 111, No. 20, 590-592, 3 fig., New York, Nov. 16, 1933.

The article describes a building constructed in San Francisco. The extra cost for steel to provide for earthquake hazard was \$2,840. This is only 1.9 per cent of the cost of the building. The total annual saving in insurance costs is estimated at \$1,046. When all comparative figures are considered a saving of 2.1 per cent is shown, the computation being on the basis of interest at 6 per cent.

2045. HARRIS, Sidon, "A Semi-graphical Method of Determining Depths of Multi-layer, Dipping Strata from Seismic Time-Travel Curves," *Amer. J. Sc.*, Fifth Ser., No. 157, Vol. 27, 13-23, 4 fig., New Haven, Jan., 1934.

— HAYES, R. C., "Seismological Report of the Hawke's Bay Earthquake of 3rd February, 1931." See No. 2003 (3) of this list.

2046. HECK, N. H. *et al.*,

(1) "Notes on the Interpretation of Strong Motion Seismograph Records," *Mim. Pub.*, U. S. C. G. S., 4 pp., 4 diag., Washington, Aug., 1933.

(2) "Analyses of Strong Motion Seismograph Records Obtained at the Time of the Nevada Earthquake of June 25, 1933," *Ibid.*, 8 pp., 2 pl., Washington, 1933.

2047. HEILAND, C. A.,

(1) "Demonstrating Geophysical Science to the Public," *Min. Met.*, No. 323, Vol. 14, 455-458, 3 fig., New York, Nov., 1933. C.A.H.

(2) "Elements of Geophysical Prospecting as Demonstrated at A Century of Progress, Chicago, 1933, in the Geophysics Section of the American Petroleum Industries Exhibit," *Quar. Col. Sc. Mines*, Vol. 28, No. 4, 1-52, 20 fig., Golden, Oct., 1933. C.A.H.

(3) "The Story of Oil at A Century of Progress," *Amer. Pet. Inst.*, Booklet of 32 pages, profusely illustrated, for distribution at A Century of Progress Exposition, Chicago, 1933.

The three publications are grouped because they each describe the exhibits related to geophysical prospecting and the oil industry. The last is not a publication by Dr. Heiland though he contributed largely to the displays there described. The companies and individuals responsible for the exhibit as a whole are named in the booklet. The two publications first named, and especially the second, are rather complete and detailed accounts of the subject, prepared for the instruction of the general public.

- HENDERSON, J., "Seismology in New Zealand." See No. 2003 (1) of this list.
2048. HIGUCHI, Seiichi, "Two-dimensional Elastic Waves Due to Double Source," *Tech. Rep., Tohoku Univ.*, Vol. 10, No. 4, 1-11, Sendai, 1932.  
On page 427 of *Sc. Abst. A.*, Vol. 36, No. 425, London, May, 1933, is given a short abstract of the above paper. W.W.D.
2049. HODGSON, Ernest A., "The Saint Lawrence Earthquake, February 28, 1925," *Bul. S.S.A.*, Vol. 15, No. 2, 84-105, 16 fig., Stanford, June, 1925.
2050. HONDA, H., "Notes on the Propagation of Elastic Waves Generated from a Cylindrical Origin," *Geoph. Mag.*, Vol. 7, No. 3-4, 249-256, Tokyo, Nov., 1933.
2051. HONDA, H., "Notes on the Mechanism of Deep Earthquakes," *Geoph. Mag.*, Vol. 7, No. 3-4, 257-267, 9 fig., Tokyo, Nov., 1933.
2052. HONDA, H., SAGISAKA, K., and TAMURA, M., "Long Period Horizontal Seismograph," *Geoph. Mag.*, Vol. 7, No. 3-4, 245-247, Tokyo, Nov., 1933.  
Four illustrations indicate the construction of this instrument, which can be operated at a period as great as 55 sec., and show records obtained with it.
2053. IMAMURA, Akitune, "On Chronic Movements of the North-west Osaka Block," *Proc. Imp. Acad.*, Vol. 9, No. 8, 378-381, 3 fig., Tokyo, Oct., 1933.
2054. IMAMURA, Akitune and KAWASE, Ziro, "The Sanriku Tunami of 1933," *Jap. J.A.G.*, Vol. 11, No. 1, 17-35, num. fig., 3 tables, Tokyo, 1933.
2055. IMBO, Giuseppe, "Dati sismici relativi alla fase esplosiva dello Stromboli del Settembre 1930," *Bul. Vol.*, Vol. 5, Nos. 15-18, 239 *et seq.*, Naples, 1933.  
The author reproduces a seismogram and readings for three shocks associated with explosions of Stromboli, with deduced phase velocity. The issues of the periodical, though published in 1933, are for the fifth publication year, 1928.  
In the same issues, under the title, "Notices de phénomènes géodynamiques communiquées au Bureau Central International de Volcanologie," are given the reports from various sea captains of twenty-three seaquakes noted during the years 1927-31. L.B.
- INABA, Yoshi and INOUE, Win, "On Barometric Gradients at Times of Earthquakes in Japan (2nd paper)." See No. 2057 of this list.
2056. INOUE, Win, "Earth-tilts Observed at Mt. Tukuba, Japan," *Bul. Eq. Res. Inst.*, Vol. 11, Part 4, 693-703, 8 fig., 7 tables, Tokyo, Dec., 1933.
2057. INOUE, Win and INABA, Yoshi, "On Barometric Gradients at Times of Earthquakes in Japan (2nd paper)," *Bul. Eq. Res. Inst.*, Vol. 11, Part 4, 704-713, 16 fig., Tokyo, Dec., 1933.



2058. ISHIMOTO, Mishio, "Preliminary Notes on the Tunami of March 2, 1933 (G.M.T.) and an Outline of the Investigations now being made concerning it at the Earthquake Research Institute," *Jap. J.A.G.*, Vol. 11, No. 1, 1-9, 2 maps, Tokyo, 1933.
2059. ISHIMOTO, Mishio, "Construction d'un sismographe accélérométrique pour la composante verticale," *Bul. Eq. Res. Inst.*, Vol. 11, Part 4, 717-723, 5 fig., Tokyo, Dec., 1933.
- ISIKAWA, T. and WADATI, K., "On Deep-focus Earthquakes in the Northern Part of the Japan Sea." See No. 2124 of this list.
2060. JEFFREYS, Harold, "Upward Curvature in Seismic Time-curves," *M.N., Geoph. Sup.*, Vol. 3, No. 5, 201-202, London, Jan., 1934.
2061. JEFFREYS, Harold and BULLEN, K. E., "Final Tables." Mimeographed issue of 4 pages, giving tables for various phases at intervals of whole degrees in epicentral distance. Cambridge, Dec., 1933.
2062. JONES, H. Spencer, "The International Union for Geodesy and Geophysics," *Observatory*, No. 714, Vol. 56, 521-523, London, Nov., 1933.  
The article is a brief account of the Lisbon meeting of the Union. The next meeting is to be held in Edinburgh in 1936.
2063. JONES, J. H., "A Seismic Method of Mapping Anticlinal Structures," *Pet. Times*, No. 758, Vol. 30, London, 1933.  
The above reference indicates only the abstract of the paper. This is quoted at length on page 963 of *Geoph. Abs.*, No. 55. See No. 2071 of this list. F.W.L.
- JUNG, K. and BERGER, R., "Seismometrische Beobachtungen in Potsdam in der Zeit vom 1. Januar 1929 bis 31. Dezember 1932." See No. 2015 of this list.
- KANAI, Kiyoshi and NISHIMURA, Genrokuro, "On the Effects of Discontinuity Surfaces upon the Propagation of Elastic Waves (II)." See No. 2093 of this list.
- KANAI, Kiyoshi, NISHIMURA, Genrokuro, and TAKAYAMA, Takeo, "On Stresses in the Interior and in the Vicinity of a Horizontal Cylindrical Inclusion of Circular Section in a Gravitating Semi-infinite Elastic Solid (II)." See No. 2094 of this list.
- KANBARA, K., MINAKAMI, T., and MATUZAWA, T., "Horizontal Movement of Water in the Tunami of March 3, 1933." See No. 2078 of this list.
- KAWASE, Ziro and IMAMURA, Akitune, "The Sanriku Tunami of 1933." See No. 2054 of this list.
2064. KAWASUMI, Hiroshi, "Study on the Propagation of Seismic Waves. (The second paper). Amplitude of Seismic Waves with the Structure of the Earth's Crust and Mechanisms of their Origin," *Bul. Eq. Res. Inst.*, Vol. 11, Part 3, 403-453, 10 fig. 11 tables, Tokyo, Sept., 1933.
2065. KNOPF, Adolph, "The Age of the Earth and the Age of the Ocean," *Ann. Rep. Smith Inst.*, 1932, Pub. No. 3185, 193-206, bib., Washington, 1933.
2066. KOENIGSBERGER, J., "Aufsuchung von Wasser mit geophysikalischen Methoden," *Bei. Angew. Geoph.*, Bd. 5, Heft 4, 463-525, 22 fig., Leipzig, 1933.  
The article has been reprinted in book form by the same publishers (Akademische Verlagsgesellschaft m.b.H., Leipzig). It is priced at RM 3.80.

2067. KRAHMANN, R., "Geophysical Investigations in Southern Africa," *Bei. Angew. Geoph.*, Bd. 4, Heft 1, 88-116, num. tab., bib., maps, Leipzig, 1933.
- LACOSTE, J., "Étude comparative du mouvement microséismique, etc." See No. 2104 of this list.
2068. LANDSBERG, H., "Über Zusammenhänge von Tiefherdbeben mit anderen geophysikalischen Erscheinungen," *Ger. Bei.*, Bd. 40, Heft 2-3, 238-243, 3 fig., bib., Leipzig, 1933.
- The author's English summary reads: "The deep-focus earthquakes show an annual variation of frequency with maxima at the equinoxes and minima at the solstices. Though some parallelism with terrestrial magnetic disturbances is given, no real connection between the two phenomena can be supposed. For the earthquakes it is shown that poleshift as a consequence of air-mass transports might be the cause. The magnetic disturbances are due to the influence of the high layers of the atmosphere, which are influenced in their turn by the great changes of general circulation at the equinoxes." H.L.
2069. LANDSBERG, H., "Über tektonische und magmatische Erdbeben," *Naturwissenschaften*, Bd. 21, Heft 51, 894-896, 2 fig., 1 table, bib., Berlin, 1933. H.L.
2070. LARMOR, Joseph, "The Tidal Strain on the Earth," *Nature*, No. 3330, Vol. 132, 313, London, Aug. 26, 1933.
2071. LEE, Frederick W., "Geophysical Abstracts," No. 54, 925-949, Oct.; No. 55, 950-977, Nov.; No. 56, 978-1005, Dec.; Washington, 1933. F.W.L.
2072. LEET, L. Don, "Velocity of Elastic Waves in Granite and Norite," *Physics*, Vol. 4, No. 10, 375-385, 6 fig., 3 tables, New York, Oct., 1933.
- A significant paragraph terminates the paper in which the author writes: "The new facts are serving rather to complicate than to clarify the situation at present. The ambiguity of current lithological interpretations of velocities and seismically effective elastic constants is looming larger at every turn. It cannot be said that a longitudinal wave speed of 5.5 km/sec. is unique for granite, or even necessarily suggestive of granite. There is as yet no seismological justification for the identification of any 'layer' of the earth's crust as either sedimentary or granitic."
2073. LEWIS, R. G., "A Search for the Mechanism of Earth Movements," *Geol. Mag.*, No. 833, Vol. 70, No. 11, 499-521, 14 fig., 2 tables, London, Nov., 1933.
2074. LÚNKENHEIMER, Federico, "La erupción del volcán chileno Quizapú," *Bol. Soc. Sis. Ital.*, Vol. 30, Fasc. 5, 155-168, Rome, 1932. F.L.
2075. LUPP, Paul, "Über die Laufzeiten gewisser P- Einsätze nach herdnahen Aufzeichnungen in Gr. Raum und die mögliche Deutung von Einsätzen durch örtliche Untergrundsverhältnisse," *Mitt. Geoph. Warte Gr. Raum., Univ. Königsberg*, No. 18, 21 pp. in reprint, 6 illus., bib., Gr. Raum, 1933.
2076. MACELWANE, James B., S.J. *et al.*, "Physics of the Earth—VI: Seismology," *N.R.C. (U.S.) Bul.* No. 90, 223 pp., 28 fig. Price \$2.00 (paper); \$2.50 (cloth). Washington, Dec., 1933.

The publication is the work of the Subsidiary Committee on Seismology, of the Committee on Physics of the Earth. The various chapters are written by Macelwane, Wood, Reid, Anderson, and Byerly. The titles of the chapters by each of these authors will be found indexed as cross references in this issue of the *Bibliography*. The lists of publications at the end of each chapter in the *Bulletin* have been carefully prepared and should be found very useful.

2077. MACELWANE, James B., S.J., "Report of the Jesuit Seismological Association," Mim. pub., 9 pp., issued by Cent. Stn. (Saint Louis Univ.) Saint Louis, 1933. J.B.M.

— MACELWANE, James B., S.J. The *Bulletin on Seismology*, issued recently by the National Research Council, U.S.A., and reported as No. 2076 of this list, contains the following chapters by Dr. Macelwane:

- Chap. 1. "Definitions and Classification of Earthquakes," pp. 1-3.
- Chap. 2. "Tectonic Earthquakes," pp. 4-8.
- Chap. 4. "Plutonic Earthquakes," pp. 32-36.
- Chap. 5. "Impact or Rock Fall Earthquakes," pp. 37-40.
- Chap. 11. "Earthquake Body Waves," pp. 106-115.
- Chap. 12. "Reflection and Refraction of Earthquake Waves," pp. 116-120.
- Chap. 13. "Earthquake Surface Waves," pp. 121-129.
- Chap. 14. "Paths and Velocities of Earthquake Waves in the Interior of the Earth," pp. 130-136.

— MACELWANE, James B., S.J.,

- (1) "The Lisbon Meeting." A report of the recent congress of the International Geodetic and Geophysical Union.
- (2) "Grover, Missouri, Earthquake of November 16, 1933."

These papers appear in *Earthquake Notes*, which is reported in item No. 2017 of this list.

— MASUDA, K. and WADATI, K., "On the Travel Time of Earthquakes (Part V)." See No. 2125 of this list.

2078. MATUZAWA, T., KANBARA, K., and MINAKAMI, T., "Horizontal Movement of Water in the Tunami of March 3, 1933," *Jap, J.A.G.*, Vol. 11, No. 1, 11-16, 5 fig., Tokyo, 1933.

2079. MAURAIN, Ch. and BRAZIER, C. E., "Sur le tremblement de terre du 3 octobre 1933," *C.R.*, T. 197, No. 15, 721-722, Paris, Oct., 1933.

The note deals with an earthquake which was felt in Paris.

J.C.

2080. MCCOLLUM, Burton, "Seismic Method of Profiling Geologic Formations," U.S. Patent No. 1,923,107, issued Aug. 22, 1933.

The invention relates to a seismic method of profiling the boundary surfaces of subterranean geologic formations. The method consists in producing a seismic wave in the earth's substance, detecting the arrival of the wave at a point in the earth's substance, producing a seismic wave above said point, and detecting the arrival of the second-mentioned wave at two spaced points adjacent to the first-mentioned point. Claims allowed—8.

The above report has been copied from *Geoph. Abs.*, No. 55, p. 974. See No. 2071 of this list.

F.W.L.



2081. MERCIER, André, "Contribution à la théorie des dérives continentales," *Pub. Obs. Genève*, Sér. A, Fasc. 23-24 (Fasc. 11-12 du Vol. 3), 471-508, 9 fig., ext. bib., Geneva, 1933.

2082. MILLIKAN, Robert A. *et al.*, "Earthquake Hazard and Earthquake Protection," Rep. Joint Com. Eq. Protection, 1-13, Los Angeles, June 6, 1933.

The above-mentioned committee has prepared a most comprehensive and well-balanced report on the Long Beach earthquake. Following a lengthy introduction the report is divided into sections as follows:

*Geological and Seismological Considerations:* Fault Structure, Prehistoric Earthquakes, Historical Earthquakes, Future Earthquakes, Variations in Risk, Protection Required, Summary.

*Effect of Long Beach Earthquake:* Areas Affected, Damage to Structures, Damage to Schools, Loss of Life, Necessary Conclusions.

*Standards of Design of Structures:* Acceleration of Earthquakes, Allowable Stresses and Load Reductions, Distribution of Forces, Complexity of Design, Recommended Standards (Horizontal Forces, Live Loads, Combined Stresses).

*Strengthening of Existing Buildings:* Basis of Original Designs, Analysis of Present Condition, Plans for Strengthening, Personnel, Costs, Methods of Financing.

*Prevention of Conflagrations:* Building Construction, Water Supply and Other Utilities, Fire Fighting Equipment, Disaster Plan, Summary.

*General Conclusions and Recommendations.*

R.R.M.

- MINAKAMI, T., MATUZAWA, T., and KANBARA, K., "Horizontal Movement of Water in the Tsunami of March 3, 1933." See No. 2078 of this list.

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(1) "Lines of Fissure through Central Japan and Sea of Japan Physically Considered," *Proc. Imp. Acad.*, Vol. 9, No. 8, 382-385, 1 fig., Tokyo, Oct., 1933.

(2) "Formation of Fossa Magna and Japanese Alps on the Fissure Line of Central Japan," *Ibid.*, 386-389, 1 fig., Tokyo, Oct., 1933.

2087. NAGAOKA, Hantaro and SHIRAI, Toshiaki, "Continental Margins as Slip Lines of Earth's Crust," *Proc. Imp. Acad.*, Vol. 9, No. 9, 490-493, 2 fig., Tokyo, Nov., 1933.

2088. NATURE, "The Baffin Bay Earthquake," *Nature*, No. 3344, Vol. 132, 845, London, Dec. 2, 1933.

The note intimates that the Baffin Bay earthquake may have been due to the fall of a meteor. Considering the magnitude of the tremors recorded at distant seismograph stations, this would, in the opinion of the reviewer, be quite out of the question. The note discusses the distribution of epicentres by latitude zones. This is not a very useful analysis as the epicentres are concentrated in limited sections of such zones. No. 1326 of these lists reports an analysis for Arctic epicentres on the basis of data available up to the year 1928. This shows that epicentres within the Arctic circle were confined to the vicinity of Iceland and Nova Zembla, except for three north of the mouth of the Lena river, Siberia, and one near Banks island, approximately north of the Mackenzie River delta, Canada. E.A.H.

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A lengthy abstract by Ayyvazoglou, listing the authors and titles of twelve papers presented at the meeting, is given in *Geoph. Abs.*, No. 55, 964-965. See No. 2071 of this list. F.W.L.

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2094. NISHIMURA, Genrokuro, TAKAYAMA, Takeo, and KANAI, Kiyoshi, "On Stresses in the Interior and in the Vicinity of a Horizontal Cylindrical Inclusion of Circular Section in a Gravitating Semi-infinite Elastic Solid (II)," *Bul. Eq. Res. Inst.*, Vol. 11, Part 3, 454-487, num. fig., num. tab., Tokyo, Sept., 1933.

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2097. ÔTUKA, Yanosuke, "Contraction of the Japanese Islands since the Middle Neogene (advance paper)," *Bul. Eq. Res. Inst.*, Vol. 11, Part 4, 724-731, 3 fig., Tokyo, Dec., 1933.
2098. PROVIERO, Antonio, "La sospensione 'Zöllner' nel sismografo 'Galitzin,'" *Atti Pont. Accad. Sc. Lincei*, Vol. 86, Fasc. sup., 8 pp., Rome, 1933.
2099. RASTALL, R. H., "Igneous Rocks and the Depths of the Earth—R. A. Daly," A Review; *Geol. Mag.*, No. 833, Vol. 70, No. 11, 522-524, London, Nov., 1933.

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In the same issue of the magazine the editor presents (pp. 481-488) a useful article entitled: "On the Preparation of Geological Manuscripts."

- REID, H. F., *The Bulletin on Seismology*, issued recently by the National Research Council, U.S.A., and reported as No. 2076 of this list, contains the following chapters by Dr. Reid:

Chap. 8. "Magnetic Effects Attributed to Earthquakes," pp. 83-86.

Chap. 9. "Mechanics of Earthquakes, Rebound Theory, Regional Strain," pp. 87-103.

Chap. 10. "The Conception of the Focus," pp. 104-105.

2100. REPETTI, W. C., S.J., "The Benguet Earthquake of August 24th, 1932," *Manila Cent. Obs., Seis. Bul. July-Dec., 1932*, 51-54, Manila, 1933.
2101. REPETTI, W. C., S.J., "Preliminary Investigation of Microseisms in Manila," *Ger. Bei.*, Bd. 40, Heft 2-3, 268-271, Leipzig, 1933.

The author concludes that, "The work done so far appears to indicate the lines along which further research should be made. This future research must elucidate the relations between barometric pressure at the centre of the typhoon, the area affected by the pumping effect, the path of the typhoon, microseismic amplitude and duration. Any definite results which may be obtained will be of special value in Manila where every means must be taken advantage of for the prediction of typhoon paths."

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— SAGISAKA, K., TAMURA, M., and HONDA, H., "Long Period Horizontal Seismograph." See No. 2052 of this list.

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W.W.D.

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— SHIRAI, Toshiaki and NAGAOKA, Hantaro, "Lines of Fissure through Central Japan and Sea of Japan Physically Considered" and "Formation of Fossa Magna and Japanese Alps on the Fissure Line of Central Japan." See No. 2086 of this list.

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2114. SOMVILLE, O., "Ondes longues dans la première phase des séismogrammes," *Ger. Bei.*, Bd. 40, Heft 2-3, 333-338, 6 fig., bib., Leipzig, 1933.

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— TAKAYAMA, Takeo, KANAI, Kiyoshi, and NISHIMURA, Genrokuro "On Stresses in the Interior and in the Vicinity of a Horizontal Cylindrical Inclusion of Circular Section in a Gravitating Semi-infinite Elastic Solid (II)." See No. 2094 of this list.

— TAMURA, M., HONDA, H., and SAGISAKA, K., "Long Period Horizontal Seismograph." See No. 2052 of this list.

2116. TERADA, Torahiko, "Luminous Phenomena Accompanying Destructive Sea-waves (Tsunami)," *Proc. Imp. Acad.*, Vol. 9, No. 8, 367-369, Tokyo, Oct., 1933.

2117. TERADA, Torahiko, "Earthquake and Fisheries (II)," *Bul. Eq. Res. Inst.*, Vol. 11, Part 4, 714-716, Tokyo, Dec., 1933.

2118. THOM, W. T., Jr., "Unknown Interior of Earth Invites Future Explorers," *Sc. N.-L.*, Vol. 24, No. 655, p. 285, Washington, Oct. 28, 1933. W.W.D.

2119. TRUSCOTT, S. J., "Problems of Mining at Great Depths," *Nature*, No. 3328, Vol. 132, 229-231, London, Aug. 12, 1933.

2120. TSUBOI, Chûji, "Vertical Crustal Displacement in the Seismic Region of Itô, on the East Coast of the Idu Peninsula," *Bul. Eq. Res. Inst.*, Vol. 11, Part 3, 488-499, 7 fig., 5 tables, Tokyo, Sept., 1933.

— TYZZER, F. G. and EISENHOUR, B. E., "Elastic Properties of Various Materials and Their Effect on the Transmission of Vibrations." See No. 2030 of this list.

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2129. WHIPPLE, F. J. W., *et al.*, "Seismological Investigations," *Thirty-eighth Ann. Rep. Com. Seis., Brit. Ass. Rep. of Leicester Mtg. 1933*, 5 pp. in reprint, London, 1933.

The report expresses the regret felt by the members of the committee at the death of Dr. J. E. Crombie and briefly outlines the support given by him to seismological investigations.

It then deals, successively, with the topics: Finance, Seismographs, British Earthquakes, The Revision of Seismological Tables, High-focus Earthquakes, Microseisms, and Periodicity of Earthquakes.

— WOOD, Harry O., *The Bulletin on Seismology*, issued recently by the National Research Council, U.S.A., and reported as No. 2076 of this list, contains the following chapters by Dr. Wood:

Chap. 3. "Volcanic Earthquakes," pp. 9-31.

Chap. 6. "Earthquake Investigations in the Field," pp. 41-66.

Chap. 7. "'Apparent' Intensity and Surface Geology," pp. 67-82.

— WOOD, Harry O., "Earthquake Waves." See No. 2126 of this list.

2130. YAMAGUTI, S., "Distribution of Earthquakes in Japan," *Bul. Eq. Res. Inst.*, Vol. 11, Part 3, 500-509, 7 fig., Tokyo, Sept., 1933.

## LIST OF COLLABORATORS

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

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— ADLER, Joseph L. and ROSAIRE, E. E., "Applications and Limitations of Dip Shooting." See No. 2218 of this list.

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2132. AGAMENNONE, G., ALESSANDRI, C., and PROVIERO, A., "Rassegna sismologica," *Bol. Soc. Sis. Ital.*, Vol. 31, No. 3-4, 101-116, Rome, 1933.

This annotated seismological bibliography begins in this issue of the *Bollettino*. It is to be continued.

A number of items reported in this issue of the *Bibliography of Seismology* and credited to G. A. were obtained from the above bibliography which was made available through the kindness of Prof. Agamennone.

— ALESSANDRI, C., PROVIERO, A., and AGAMENNONE, G., "Rassegna sismologica." See No. 2132 of this list.

— ALLEN, Maxwell W., "Destructive and Near-destructive Earthquakes in California and Western Nevada, 1769-1933." See No. 2172 of this list.

2133. AMBRONN, Richard, "Apparatus for the Measurement of Technical Vibrations and Seismographs on the Piezo-electrical Principle." Advertising Circular issued from Göttingen, 1933, 4 pp., 5 fig.

This circular is most satisfactory in that it gives a really good description of the apparatus and lists various combinations of equipment giving the prices of the individual items and those for the combinations. If the claims of the manufacturer are valid the equipment described would be most convenient to handle in field operation. The cost of the most sensitive instruments for six seismographs simultaneously recording on the same drum, including packing, totals RM 13700. These give a magnification up to about three or four millions at 100 cycles. The circular gives a bibliography indicating reports of investigations made by the help of this apparatus.

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2138. BOBILLIER, C., "La sismicidad de Chile durante el año de 1931 y resumen historico de los principales maremotos acaecidos en Chile," *Bol. Sis. Univ. Chile*, No. 23, 41 pp., 2 fig., Santiago, 1933. G.A.
2139. BODLE, Ralph R. *et al.*, "Earthquake Notes," *Pub. E. S., S. S. A.*, Vol. 5, No. 4, 8 pp., Washington, Mar., 1934.
- The announcement is made that the Annual Meeting of the Eastern Section, S. S. A., will be held in New York, April 30 and May 1, 1934, at Fordham University. In addition to other brief items of interest this issue contains the following short papers: "The Seismograph Station at Montezuma, Chile," by C. P. Butler, "The Utah Earthquake, March 12, 1934," "Indian Earthquake, January 15, 1934," "Annual Exhibit of the Carnegie Institution of Washington," "Study of Seismograph Characteristics," "New Vibration Recording Instrument Successful," "Earthquake Insurance in New Zealand," "Earthquake Insurance in the United States."
2140. BOIS, Ch., "Recherches sur les séismographes destinés à l'inscription de la composante verticale du mouvement du sol," *U.G.G.I., Sec. Séis., Sér. A, Trav. scien.*, Fasc. 8, 5-120, 45 fig., bib., Strasbourg, 1933.
- This very complete and valuable paper deals with many phases of the subject, some of which may be indicated as follows:
- (1) History.
  - (2) Recent researches: optical instruments, mechanically recording instruments.
  - (3) Methods of obtaining the optimum period.
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2143. BOWIE, William, "A Comparison of Isostasy in India and in the United States and Southern Canada," *Ger. Bei.*, Bd. 41, Heft 2, 250-259, 2 fig., bib., Leipzig, 1934.
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2145. BRAHTZ, J. H. A., "Photoelastic Apparatus at the California Institute of Technology," *R.S.I.*, Vol. 5, No. 2, 80-83, 4 fig., Lancaster, Feb., 1934.

2146. BULLEN, K. E., "The Constants of Seismological Observatories," *Brit. Ass., Gray-Milne Trust*, 14 pp., Newport, 1933. K.E.B.

The author presents a list of about 400 stations with the latitude and longitude of each and the constants  $a$ ,  $b$ , and  $c$  used in computing epicentral distances by Turner's method. These have been very carefully checked and should prove a decided step toward the final elimination of errors in the published lists of the geographical coordinates. There are still some discrepancies between this list and that by Gutenberg and Richter (see No. 2043 of these lists), which are being investigated by the latter authors preparatory to issuing a supplementary report. To any investigator who has had experience in making use of published geographical co-ordinates this work will be much appreciated. Every list previous to these latest investigations, which the reviewer has had occasion to use, has been found to contain an error or errors, the use of which would lead to incorrect values of the epicentral distance and make a corresponding misplacement of the plotted point on the time-distance graph. E.A.H.

- BUTLER, C. P., "The Seismograph Station at Montezuma, Chile." See No. 2139 of this list.
- BYERLY, Perry, "Destructive and Near-destructive Earthquakes in California and Western Nevada, 1769-1933." See No. 2172 of this list.
- CALLAGHAN, Eugene and GIANELLA, Vincent P., "The Earthquake of December 20, 1932, at Cedar Mountain, Nevada, and its Bearing on the Genesis of Basin Range Structure." See No. 2165 of this list.

2147. CALOI, Pietro, "Due tipi d'onde caratteristici tra le fasi  $S$  ed  $L$  di un telesisma: le onde  $SL$  ed  $SM$ ," *Ric. Sc. Bol. Geod. Geof.*, Anno 5, Vol. 1, No. 2, 5 pp., 2 pl., Rome, 1934. P.C.

2148. CARLETON, R. B., "Suitability of Materials for Photoelastic Investigations," *R.S.I.*, Vol. 5, No. 1, 30-32, 7 fig., 1 tab., Lancaster, Jan., 1934.

The author's abstract reads: "Glass, celluloid, cellulose acetate, hard and soft rubber and seven synthetic resins have been tested to determine their suitability for photoelastic investigations. The stress-strain relations, photoelastic coefficients and annealing temperatures have been measured. It is concluded that the synthetic resins Phenolite, Bakelite and L'Orca are among the most satisfactory materials for photoelastic purposes."

2149. CRESKOFF, Jacob J., "Dynamics of Earthquake Resistant Structures," McGraw-Hill Book Co., 127 pp., illus. Price \$2.50. New York, 1934. R.R.B.+McG-H.

The table of contents, as given by the publishers, is as follows:

- (1) Earthquake History of the United States.
- (2) Seismography.
- (3) Seismic Motion of a Particle.
- (4) Dynamics of Earthquake Motion.
- (5) Deflections of Beams in Moment and Shear.
- (6) Free Transverse Vibrations of a Slender Beam.
- (7) Forced Transverse Vibrations of a Slender Beam.
- (8) Distribution of Seismic Shear and Moment.
- (9) Application to Buildings.
- (10) Aseismic Design of a Tall Building.
- (11) Aseismic Design of a Short Building.



2150. DAVIS, Watson, "Optical Problems Involved in a Comprehensive System of Bibliography," *J. Op. Soc. Amer.*, Vol. 24, No. 2, p. 58, New York, Feb., 1934.

The abstract only of a paper proposing a complete bibliographical service covering "all scientific published material, past, present, and future." The paper deals particularly with the optical problems involved in the working out of the scheme proposed.

2151. DAVISON, Charles, "The Japanese Seismic Sea-waves of March 3, 1933," *Nature*, No. 3350, Vol. 133, 72-73, 1 map, London, Jan. 13, 1934.

2152. DAVISON, Charles, "The Earthquake-series of Itô (Japan)," *Geog. Jour.*, Vol. 83, No. 3, 228-231, 2 fig., bib., London, Mar., 1934.

2153. DAY, Arthur L. *et al.*, "Seismology: Report of the Advisory Committee," *Car. Inst. Wash., Year Book*, No. 32 (1932-1933), 362-372, Washington, 1934.

The report is divided into subsections under the following headings: Geodetic Work in Regions of Seismic Activity; Earthquake Studies of the Seismological Laboratories; Instrumental Equipment; Studies in Comparative Seismology.

2154. DERJAGIN, B., "Absorption of Seismic and Acoustic Waves and its Dependence on Frequency" (in Russian), *Jour. Geoph.*, Vol. 2, No. 3-4, 337-341, Moscow, 1933.

A review by W. Ayvazoglou appears as No. 1730, page 1012, of *Geoph. Abs.* See No. 2191 of this list. The above is the second paper by the same author on this subject. For reference to the earlier paper see No. 1812 of these lists. F.W.L.

2155. DESCOTES, M., S.J., "Courbes isodiastématiques: nouvelle méthode pour les calculer," *U.G.G.I., Sec. Séis., Sér. A, Trav. scien.*, Fasc. 9, 98-114, 1 fig., 2 pl., bib., Strasbourg, 1933.

The author presents a short method of computing the data for constructing an azimuth-distance chart. These charts are most useful in seismological investigations where effects of azimuth are to be checked roughly but frequently; and they are useful also in approximate location work. Prof. Rothé appends a short bibliography quoting papers by G. Grablowitz, E. Tams, C. Zeissig, A. Sieberg, Rudolph and Szirtes. These are given in this list as cross references under the respective names.

Such charts have been published for various other places as well. They will be found in the publications listed in this Bibliography as Nos. 1054 (L. D. Leet, *re* Ottawa), 1317 (S. Gold, *re* Ottawa), and 2025 (C. G. Dahm, *re* Hawke Bay, New Zealand). In the case of the paper by Gold, some interesting mathematical aspects of the direct method of computing such a chart are presented.

Mention may also here be made of the fact that the late Prof. Woodworth of Harvard had an azimuth-distance chart constructed on Mercator Projection maps for each of the then-existing seismograph stations of the world. By means of facsimile world maps, drawn on transparent paper, he was able to use the charts for the location of epicentres. One transparent map was used for each earthquake. Laid over the charts, one at a time, the azimuth distance lines for the particular earthquake and station were traced on the transparent map. The intersections permitted an approximation to the position of the epicentre. E.A.H.

2156. DÖRR, Josef Norbert, "Über drei Kleinbeben in Österreich in Jahre 1932," *Anzeiger, Akad. Wiss. Wien, M-n. Kl.*, Jahr. 70, 121-122, 2 pl., Wien, 1933.

The paper deals with the following earthquakes:

21 Oct., 1932 (Salzburg, Leoganger Steinberg).

15 Nov., 1932 (Steiermark, oberes Murtal).

23-24 Dec., 1932 (Niederösterreich, nordwestliches Waldviertel). R.Z.

2157. EARTHQUAKE RESEARCH INSTITUTE, TOKYO IMPERIAL UNIVERSITY, "Seismometrical Reports." (i) 1924-1930, 66 pp., Tokyo, 1934. (ii) 1933, Part 3, July 1-Sept. 30, 1933, 15-21, 6 pl., Tokyo, 1934.

2158. ENDRÖS, A., "Beobachtungen über die Dämpfung der Seiches in Seen," *Ger. Bei.*, Bd. 41, Heft 2, 130-148, Leipzig, 1934.

2159. ENGINEERING NEWS-RECORD, "Earthquake in Japan Affects Tide Gage in Golden Gate at San Francisco," *Eng. N.-R.*, Vol. 112, No. 5, p. 146, New York, Feb. 1, 1934.

2160. ENGINEERING NEWS-RECORD, "Mulholland Dam above Los Angeles, Reinforced," *Eng. N.-R.*, Vol. 112, No. 10, 335, 1 illus., New York, Mar. 8, 1934.

A brief note and half-tone describing the back-fill protection being given the Mulholland Dam to make it earthquake resistant.

2161. EVANS, L. T. and ROSSEN, M., "Earthquake Damage to Masonry Structures, and Their Repair," *Amer. Concrete Inst. Jour.*, Vol. 5, No. 2, 129-136, Nov.-Dec., 1933. R.R.M.

2162. FUJIWHARA, S., TSUJIMURA, T., and KUSAMITSU, S., "On the Earth-vortex, Echelon Faults, and Allied Phenomena," *Ger. Bei., Supbd. II*, 303-360, 50 fig., bib., Leipzig, 1933.

2163. GASSMANN, F., "Zur Auswertung der Diagramme von Seismographen und Erschütterungsmessern," *Verhand. Schweiz. Natur. Ges.*, 114 Jahresversammlung vom 1. bis 3. Sept., 1933, 342-344, Aarau, Switz., 1933. R.Z.

2164. GERECKE, Fr. and RAMSPECK, A., "Boden- und Gebäudeschwingungen in Rastatt nach dem Erdbeben vom 8. Februar 1933," *Zeit. Geoph.*, Jahr. 9, Heft 6-8, 342-350, 6 fig., Braunschweig, 1933.

The above publication is No. 10 of the series: *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

2165. GIANELLA, Vincent P. and CALLAGHAN, Eugene, "The Earthquake of December 20, 1932, at Cedar Mountain, Nevada, and its Bearing on the Genesis of Basin Range Structure," *Jour. Geol.*, Vol. 42, No. 1, 1-22, 10 fig., bib., Chicago, Jan.-Feb., 1934.

- GRABLOWITZ, G., "Weltkarte der Entfernungen und der Azimute für Hamburg," Sonderdruck aus der Monatsschrift "Die Erdbebenwarte," Jahrgang VI, 1906-1907. Carte au 1/140,000,000. E.R.

See No. 2155 of this list.

2166. GRACY, J., "La reconstruction de Tokio et Yokohama après le tremblement de terre de 1923," *Musée Social*, 269-288, Paris, 1930. G.A.

Compare No. 1459 of these lists.

2167. GREEN, N. B. and HORNER, A. C., "Earthquake Resistance of Timber Floors," *Eng. N.-R.*, Vol. 112, No. 5, 142-145, 4 fig., 1 tab., New York, Feb. 1, 1934.

2168. GUTENBERG, Beno, "Das 'Seismological Laboratory' in Pasadena," *Ger. Bei., Supbd. II*, 213-237, 12 fig., bib., Leipzig, 1933.

2169. GUTENBERG, Beno, "The Propagation of the Longitudinal Waves Produced by the Long Beach Earthquake," *Ger. Bei.*, Bd. 41, Heft 1, 114-120, 3 fig., 4 tab., bib., Leipzig, 1934. R.R.B.

2170. GUTENBERG, Beno and RICHTER, C. F., "On *PP'* and Related Waves," *Ger. Bei.*, Bd. 41, Heft 2, 149-159, 5 fig., bib., Leipzig, 1934.

2171. GUTENBERG, Beno and RICHTER, C. F., "Contribution to the Study of Deep-focus Earthquakes," *Ger. Bei.*, Bd. 41, Heft 2, 160-169, Leipzig, 1934.

The authors introduce the paper by the following: "In the following pages are presented certain rapid and convenient methods for interpreting the records of deep-focus earthquakes. These methods are in regular use at Pasadena, and furnish the basis for the discussion of new phases in the preceding paper. The procedure is by no means in a final state; it is offered here in justification of the preceding results and as a contribution to the rapidly developing theory of these interesting shocks." (By *preceding results* the authors indicate those given in the paper reported next above as No. 2170 of this list.)

- HARDING, R. L., WEATHERBY, B. B., and BORN, W. T., "Granite and Limestone Velocity Determinations in Arbuckle Mountains, Oklahoma." See No. 2239 of this list.

2172. HECK, N. H., *et al.*, "Destructive and Near-destructive Earthquakes in California and Western Nevada, 1769-1933." Mimeographed publication of the U.S. Coast and Geodetic Survey, Washington, 1933. This list, 21 pages of closely typed material, was prepared by the Coast and Geodetic Survey officials with the assistance of Messrs. H. O. Wood, Maxwell W. Allen, Perry Byerly, and S. D. Townley. N.H.H.

2173. HECK, N. H., "Vibration Meter for Earthquake Studies of Buildings," *Eng. N.-R.*, Vol. 110, No. 10, 315, 1 fig., New York, Mar. 8, 1934.

2174. HÉE, Mme. A., "La fréquence des tremblements de terre en Algérie (1925-1932)," *U. G. G. I., Sec. Séis., Sér. B, Monog.*, Fasc. 5, 59-108, 6 fig., num. tab., Strasbourg, 1933.

A previous paper on the same subject, covering the years 1911-1924, appeared in Fasc. 2 of this same series.

2175. HÉE, Mme. A., "Étude des battements électriques: application à le séismologie et à l'étude des constantes diélectriques," *U.G.G.I., Sec. Séis., Sér. A, Trav. scien.*, Fasc. 9, 3-97, 44 fig., num. tab., bib., Strasbourg, 1933.

2176. HILLER, W., "Der Herd des Rastatter Bebens am 8. Februar 1933," *Ger. Bei.*, Bd. 41, Heft 2, 170-180, 3 fig., 2 tab., bib., Leipzig, 1934. W.H.

The macroseismic and microseismic evidence together serve as the basis for the determination of the position of this epicentre and for the deduction that it is in the form of a "focus-line" from ten to fifteen kilometers in length. The depth of focus is found to be about 30 kilometers. The first motion registrations are found to be dependent on the azimuth from the epicentre and indicate that the dislocation at the focus was a shear.

2177. HODGSON, Ernest A., "Surface-reflected Waves of Shallow-focus Earthquakes," *Bul. S.S.A.*, Vol. 24, No. 1, 33-46, 7 fig., 2 tab., bib., Stanford, Jan., 1934.

2178. HODGSON, Ernest A., "Making the World Safe by Seismology," *J.R.A.S.C.*, No. 231, Vol. 28, No. 2, 49-57, Toronto, Feb., 1934.

Reporting an address given before the Montreal Amateur Athletic Association, on Thursday, Jan. 11, 1934.

- HORNER, A. C. and GREEN, N. B., "Earthquake Resistance of Timber Floors." See No. 2167 of this list.

2179. HOSKINS, Leander M. and JACOBSEN, Lydik S., "Water Pressure in a Tank Caused by a Simulated Earthquake," *Bul. S.S.A.*, Vol. 24, No. 1, 1-32, 10 fig., Stanford, Jan., 1934.

2180. HUNTER, J. de Graaff, "The Indian Earthquake (1934) Area," *Nature*, No. 3355, Vol. 133, 236-237, London, Feb. 17, 1934.

The note is accompanied by a sketch map on which is marked the position of the epicentre. This is placed, approximately, at 27° N., 86° E. The source of the information fixing this position is not given. The relationship of this epicentre to the distribution of gravity is discussed and indicated by underload contours on the map.

A note regarding the above discussion appears in *Science*, No. 2043, Vol. 79, p. 6 (Supp.), with the title: "Earth Level and the Indian Earthquake."

2181. IMAMURA, Akitune, "Past Tunamis of the Sanriku Coast," *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 2, 79-93, 12 fig., 2 tab., Tokyo, 1934. A.I.

2182. ISHIMOTO, Mishio and KIMURA, Motoharu, "Construction d'un appareil analyseur en fréquence et son application aux inscriptions sismographiques," *Bul. Eq. Res. Inst.*, Vol. 12, Part 1, 20-23, 20 fig., Tokyo, Mar., 1934.

2183. ITOO, Tokunosuke, "Note on the Tilting of a Rigid Pillar Caused by an Earthquake," *Proc. P-M. Soc. Jap.*, Vol. 15, No. 6, 246-247, Tokyo, 1933.

2184. ITOO, Tokunosuke, "Sur les séismes des grands fonds au Japon," *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 2, 71-78, 3 fig., bib., Tokyo, 1934.

- JACOBSEN, Lydik S. and HOSKINS, Leander M., "Water Pressure in a Tank Caused by a Simulated Earthquake." See No. 2179 of this list.

- KIMURA, Motoharu and ISHIMOTO, Mishio, "Construction d'un appareil analyseur en fréquence et son application aux inscriptions sismographiques." See No. 2182 of this list.



2185. KIROFF, K. T., "Les calamités géophysiques en Bulgarie, 1928-29. Les tremblements de terre catastrophiques des 14 et 18 avril, 1928, en Bulgarie méridionale," *Mat. E. Cal.*, No. 26, p. 106, Coimbra, 1931. G.A.

See also No. 1346 of these lists.

2186. KLEINSCHMIDT, E., "Erwiderung auf den Aufsatz von R. Tomaschek und W. Schaffernicht: Die Flut der festen Erde," *Zeit. Geoph.*, Jahr 9, Heft 6-8, 308-309, Braunschweig, 1933.

The above criticism is directed against the paper reported as No. 1987 of these lists. It is replied to by Tomaschek and Schaffernicht on page 309 of the same journal under the heading "Bemerkung hierzu."

2187. KRUMBACH, G.,

- (1) "Seismische Registrierungen in Jena; 1. Januar bis 31. Dezember 1931," *Veröff., Jena*, Heft 18, 24 pp., Jena, 1932.
- (2) "Die Ausbreitung von Erdbebenwellen in grossen Herdentfernungen bei dem Südseebeben vom 26. Juni 1924." *Ibid.*, Heft 16a, 68 pp., 16 fig., bib., Jena, 1934.
- (3) "Die instrumentellen Aufzeichnungen des Erdbeben vom 26. Juni 1924," *Ibid.*, Heft 16b, 9 pp., 24 pl., Jena, 1934.
- (4) "Seismische Registrierungen in Jena; 1. Januar bis 31. Dezember 1932," *Ibid.*, Heft 20, 20 pp., Jena, 1933.
- (5) "Seismische Registrierungen in Jena; 1. Januar bis 31. Dezember 1933," *Ibid.*, Heft 22, 24 pp., Jena, 1934. A.S.

— KUSAMITSU, S., FUJIWHARA, S., and TSUJIMURA, T., "On the Earth-vortex, etc." See No. 2162 of this list.

2188. LACOSTE, J., "Tremblements de terre Mexicains: tremblement de terre du 14 janvier 1931," *U.G.G.I., Sec. Séis., Sér. B, Monog.*, Fasc. 5, 3-58, num. tab., bib., Strasbourg, 1933.

2189. LAGALLY, M., "Mechanik und Thermodynamik des stationären Gletschers," *Ger. Bei., Supbd. II, Ergebnisse der Kosmischen Physik*, 1-94, bib., Leipzig, 1933.

Section III of this paper deals with the subject "Das Eis als elastischer und plastischer Körper," and subsection 13 with "Seismische Tiefenmessung."

2190. LAGRANGE, E., "Sur l'histoire du pendule horizontal en Italie," *Ciel et Terre*, T. 30, Séance du 6 mars, 1932, Brussels. G.A.

2191. LEE, Frederick W., "Geophysical Abstracts," No. 57, 1006-1059, Jan.; No. 58, 1060-1080, Feb.; No. 59, 1081-1104, Mar.; Washington, 1934. F.W.L.

2192. LEET, L. Don, "New Recording Vault of the Harvard Seismograph," *Bul. S.S.A.*, Vol 24, No. 1, 47-50, 2 fig., Stanford, Jan., 1934. L.D.L.

2193. LEWIS, R. G., "Subsidence in the European Area," *Geol. Mag.*, No. 836, Vol. 71, 76-85, 1 fig., bib., London, Feb., 1934.

2194. LEYPOLDT, Harry, "Earth-movements in California Determined from Apparent Variation in Tidal Datum Planes," *Bul. S.S.A.*, Vol. 24, No. 1, 63-68, 3 fig., Stanford, Jan., 1934.

2195. LYSE, Inge, "Current Work at Lehigh University," *Eng. N.-R.*, Vol. 112, No. 7, 225-226, 3 illus., New York, Feb. 15, 1934.

Included in this short note is a description of the photo-elastic apparatus designed to test the distortion of steel frames.

2196. MACELWANE, James B., S.J., "Studies of Earthquake Action Promise Better Structures," *Eng. N.-R.*, Vol. 111, No. 26, p. 779, New York, Dec. 28, 1933.

See also editorial comment in same issue, p. 792.

2197. MACMILLAN, H. G., "Note on the Long Beach Earthquake and Plants," *The Plant Disease Reporter, Plant Disease Survey, Division of Mycology and Disease Survey*, Vol. 18, No. 2, 16-18, Washington, Mar. 15, 1934. H.T.G.

The author quotes a statement by Tschudi, a traveller in Peru (J. J. Tschudi, *Travels in Peru*, New York, 1847) to the effect that in Peru earthquakes often resulted in converting luxuriant lands to barren wastes. He discusses this matter and presents the fact for what it may be worth that the Long Beach earthquake produced no appreciable visible effect on growing crops, either at the time of the quake or later.

— MANOHAR, M. D., and BANERJI, S. K., "On the Artificial Vibrations of the Ground." See No. 2136 of this list.

2198. MATUZAWA, Takeo, "Comparison of Movement of Water in a V-shaped Bay with that in a U-shaped Bay," *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 2, 67-70, 3 fig., Tokyo, 1934.

2199. MEINESZ, F. A. Vening, "Ergebnisse der Schwerkraftbeobachtungen auf dem Meere in den Jahren 1923-1932," *Ger. Bei., Supbd. II*, 153-212, 7 fig., 4 pl., bib., Leipzig, 1933.

2200. MEISSER, O., "Angewandte Geophysik," *Mitt. Reichsan. Erd. Jena*, Heft 5, being pp. 1108-1121 of the *Handwörterbuch der Naturwissenschaften* published by Gustav Fischer, Jena. A.S.

See also No. 2226 of this list.

2201. MIHAILOVIĆ, Jélénko,

(1) "La région séismique de Timok," *Ann. Géol. Péninsule Balkanique*, T. 11, Fasc. 2, 268-281, 1 pl., Beograd, 1933.

(2) "La séismicité de la Thrace, de la mer de Marmara et de l'Asie Mineure," *Pub. Inst. Séis. Univ. Beograd*, 77 pp., 80 fig., 1 pl., bib., Beograd, 1933. (Fasc. 2, Sér. B, Monog. et Trav. scien., Comité National du Royaume Yougoslavie, U.G.G.I.)

(3) "La séismicité de la Bulgarie du Sud," *Ibid.*, 42 pp., 47 fig., 11 pl., bib., Beograd, 1933. (*Ibid.*, Fasc. 3.) J.M.

2202. MINES MAGAZINE, "Geophysical Prospecting in Japan," *Mines Mag.*, Vol. 24, No. 3, p. 7, Golden, Mar., 1934.

A short note, signed M. W. B., concerning the activities of Prof. Yoshizo Fujita, professor of mining engineering at Kyoto Imperial University, describes him as an "outstanding leader in the development of geophysical work in his country".

2203. MIYABE, Naomi, "Provisional Result of the Recent Revision of Precise Levelling in Tokyo," *Proc. Imp. Acad.*, Vol. 9, No. 10, 588-591, Tokyo, Dec., 1933.

2204. MONDELLO, Ugo, "Ricerche sulla sismicità brasiliana," *Bol. Soc. Sis. Ital.*, Vol. 31, No. 3-4, 61-79, 3 fig., Rome, 1933. G.A.

This is the second part of the paper on this subject by the above author. The first part was reported as No. 1962 of these lists.

2205. MONONOBE, Nagaho, "Ultimate Strength of Building Structures against Earthquakes," *Bul. Eq. Res. Inst.*, Vol. 12, Part 1, 35-43, 8 fig., Tokyo, Mar., 1934.

2206. NAGAOKA, Hantaro and SHIRAI, Toshiaki, "Continental Margins as Slip Lines: Formation of Japanese Arcs and Deep Seated Earthquakes," *Proc. Imp. Acad.*, Vol. 9, No. 10, 584-587, 1 map, Tokyo, Dec., 1933.

The above is a second communication by these authors on the same subject. The first paper was reported as No. 2087 of these lists.

2207. NATURE. The following short notes of interest to seismologists have appeared recently in *Nature* (London):

- (1) "Sensitiveness of Fish to Earthquakes," No. 3343, Vol. 132, p. 817, Nov. 25, 1933.
- (2) "Earthquake Insurance (in New Zealand)," No. 3349, Vol. 133, p. 22, Jan. 6, 1934.
- (3) "India Earthquake of January 15th," No. 3351, Vol. 133, p. 94, Jan. 20, 1934.
- (4) "Long Beach Earthquake of March 10, 1933," *Ibid.*, p. 108. R.R.B.

2208. NAVARRO NEUMANN, M. Ma. S., S.J., "La station sismologique de la Compagnie de Jésus à Cartuja (Espagne)," *Revue des questions scientifiques*, Sept. 20, 1932.

A review, signed R.M., appears on pp. 262-263 of *Mat. E. Cal.*, No. 30-31, Geneva, 1933.

2209. NEUMANN, Frank, "United States Earthquakes, 1932," *U.S.C.G.S. Pub.*, No. 563, p. 21, Washington, 1934. F.N.

2210. NÖLKE, Friedrich, "Der Ursprung des Mondes," *Ger. Bei.*, Bd. 41, Heft 1, 86-91, Leipzig, 1934.

The author's English abstract reads: "Recently the widespread hypothesis that the moon had separated from the earth and left behind the basin of the Pacific as a scar, has been very much shaken by a strong objection of Mr. Jeffreys, and as other objections could be made, this theory cannot be maintained. Nevertheless the

birthplace of the moon is to be searched for in the neighbourhood of the earth, since the moon enlarges its orbit by tidal friction. Jeffreys' hypothesis of the moon being captured by the earth as well as that of Laplace of its being thrown off at the boundary of the atmosphere above the equator are not admissible. But the moon may have taken rise in the interior of the primary atmosphere out of condensable gases describing free circular orbits in a defined equatorial ring-district."

2211. OXFORD UNIVERSITY, "Heavy Motor Traffic in High Street," *University College Oxford Record*, pp. 3-5, 2 pl., 1932-1933.

A graph of traffic vibrations is shown as recorded by a seismograph in University College, Oxford. A record of a North sea earthquake on June 7, 1931, by a seismograph in Oxford University Observatory, compared with the traffic record, showed that the disturbance of the former was trifling as compared with the daily and nightly vibrations of commercial traffic in Oxford. E.M.K.

2212. OXFORD UNIVERSITY, "International Seismological Summary, Oct., Nov., Dec., 1929," pp. 421-518, Oxford, 1933.

— PROVIERO, A., AGAMENNONE, G., and ALESSANDRI, C., "Rassegna sismologica." See No. 2132 of this list.

— RAMSPECK, A. and GERECKE, Fr., "Boden- und Gebäudeschwingungen in Rastatt nach dem Erdbeben vom 8. Februar 1933." See No. 2164 of this list.

2213. REICH, H., "Bemerkungen zur angewandten Seismik," *Zeit. Geoph.*, Jahr 9, Heft 6-8, 350-353, 1 fig., Braunschweig, 1933.

The above paper is in the nature of a critical discussion of a paper by O. v. Schmidt (reported as No. 1092 of these lists) entitled: "Angewandte Seismik." A reply to the above paper is made by von Schmidt (*Ibid.*, pp. 354-355), under the title: "Zu vorstehender Arbeit von H. Reich, 'Bemerkungen zur angewandten Seismik'".

— RICHTER, C. F. and GUTENBERG, Beno, "On  $PP'$  and Related Waves." See No. 2170 of this list.

— RICHTER, C. F. and GUTENBERG, Beno, "Contribution to the Study of Deep-focus Earthquakes." See No. 2171 of this list.

2214. ROBINSON, I. R. and BENJAMIN, H. L., "Effects of Earthquakes on Electrical Supply Systems." Paper read at the Annual Meeting of the New Zealand Society of Civil Engineers, 1933. Proceedings published by Ferguson and Osborne, Wellington, N.Z., 1933.

The paper deals with the effects on electrical equipment of the Hawke Bay earthquake of 1931, Feb. 3, and suggests a number of precautions desirable to ensure continuity of electrical services in the event of another similar disaster. The most novel among these suggestions would appear to be the idea of providing a floating powerhouse which could be moved to any large port as required. L.B.

2215. RODÉS, Luis, S. J., "The Influence of the Moon on the Frequency of Earthquakes," *Ger Bei.*, Bd. 41, Heft 2, 209-211, 4 fig., Leipzig, 1934.



2216. ROHLEDER, Herbert P. T., "Beiträge zur Kenntnis der Erdbebenkunde und seismischakustischen Phänomene Nord-Rhodesiens," *Zeit. Geoph.*, Jahr 9, Heft 6-8, 325-332, 2 fig., Braunschweig, 1933.

A publication appearing in 1927 and reported as No. 568 of the earlier series of this *Bibliography* published in the *Bul. S.S.A.*, dealt also with the elusive phenomenon of seismic sounds or "brontides," as noted in north Ireland. As remarked in that earlier reference, it is interesting in this connection to read pp. 62-65 of Davison's "Manual of Seismology" (*Bib. Seis. Old Ser. No. 218*).

2217. ROMAN, Irwin, "Analysis of Seismic Profiles," *A.I.M.M.E.*, Contrib. 64, 35 pp., New York, Nov., 1933.

The author's abstract is quoted on pp. 1013-1014 as item 1733 of *Geoph. Abs.* See No. 2191 of this list. It may be quoted, in part, as follows: "In this paper some general formulas for seismic prospecting have been developed and applied in the cases of horizontal layering, including rectangular intrusions, such as salt domes. The results may be extended to other structures, such as faults and tilted layers. The primary problem has been that of a prism of salt embedded in the lowest layer of a group of homogeneous horizontal beds. While the principal attempt has been to make the analysis of the various possible cases a few general conclusions may be drawn."

F.W.L.

2218. ROSAIRE, E. E. and ADLER, Joseph L., "Applications and Limitations of Dip Shooting," *Bul. Amer. Ass. Pet. Geol.*, Vol. 18, No. 1, 119-132, 5 fig., Tulsa, Jan., 1934.

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- (2) "Earthquake Centered under Northeastern China Sea," No. 672, p. 120, Feb. 24, 1934, indicating the epicentre of the earthquake of Feb. 13, 1934.
- (3) "Quake Shakes Sea Bottom among Japanese Islands," No. 673, p. 136, Mar. 3, 1934, indicating the epicentre of the earthquake of Feb. 24, 1934.
- (4) "Observing Ground Tilt May Aid Earthquake Prediction," No. 674, p. 150, Mar. 10, 1934, reporting an address by Capt. N. H. Heck before the Brooklyn Academy of Arts and Sciences.
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The above publication, a chapter of the *Handwörterbuch*, contains 33 illustrations. For other contributions by the same author to the same book, see No. 1873 of these lists.

The publications of the *Reichsanstalt für Erdbebenforschung in Jena* are in two series: *Mitteilungen* and *Veröffentlichungen*. On the cover of the above issue of the former series is given a list of Hefte 1-15 of the latter. Hefte 16 and 16a are reported as Nos. 2187 (2) and 2187 (3) of this list. Heft 17 was reported as No. 1259 of these lists and Heft 19 as No. 1623. Hefte 18, 20, 21, and 22 are reported in this issue as Nos. 2187 (1), 2187 (4), 2227, and 2187 (5), respectively. Heft 22 is the latest to appear in this series.

Of the *Mitteilungen*, Heft 2 was reported as No. 81 of the earlier series of bibliographical items published in the *Bul. S.S.A.* Hefte 3, 4, and 5 are reported in

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# Bibliography of Seismology

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- (2) Mushketov, D., "Seismical Regions of Central Asia," *Ibid.*, No. 34, 1-26, 1933.
- (3) Zschocher, V., "Seismic Regions of Central Asia from the Viewpoint of Quake-proof Structures," *Ibid.*, No. 34, 27-31, 1933.
- (4) Spesivceva, V. P., "Historical and Statistical Materials Concerning Seismic Activity in Central Asia," *Ibid.*, No. 34, 33-59, 1933.

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E.A.H.

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"From the direction of first motion on the records it is concluded that a sufficient source would have been motion on a fault of strike about  $N 35^\circ W$ , the movement being up on the easterly side and down on the westerly side.

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The series of publications on the Location of Epicentres, begun in 1911 by the Dominion Observatory and carried through continuously to the end of 1927, is terminated with the above publications.

2271. EARTHQUAKE RESEARCH INSTITUTE, "Papers and Reports on the Tsunami of 1933 on the Sanriku Coast, Japan," *Sup. Vol. 1*, of the *Bul. Eq. Res. Inst.*; Part 1, 1-271; Part 2, 1-250; 226 pl., Tokyo, March, 1934.

The most complete discussion of the destructive tsunami of 1933 is divided into two parts devoted respectively to Papers and Reports. Much of Part 1 is in English, some in Japanese. Part 2 is all in Japanese. Both parts appear in the same volume. There are sixteen papers in Part 1. An index to these will be found in the present issue of the *Bibliography*, listed under the names of the authors: Imamura, Ishimoto, Hagiwara, Terada, Yamaguti, Matuo, Inouye, Musya, Miyabe, Otuka, Takahasi, Nishimura, Kanai, Nasu, Suyehiro, and Takayama. Some of the above authors have contributed more than one paper. Some papers are issued by joint authors. Part 2 presents: Seismometrical Report, Mareograms, Reports of Field Investigations, Responses to Questionnaires, Reports on Sea Shocks, Damages, Maps and Photographs.

2272. ERICSSON, Sven, "Notas sobre la teoria Peruana respecto al origen e prevision de temblores," *Bol. Soc. Geog. Lima*, T. 51, No. 1, 46-50, Lima, 1934.

2273. EWING, Maurice, CRARY, A. P., and THORNE, A. M., Jr., "Propagation of Elastic Waves in Ice. Part I," *Physics*, Vol. 5, No. 6, 165-168, 4 fig., New York, June, 1934.

Part II of the report, by the first two only of the above authors, appears in the same journal, Vol. 5, No. 7, 181-184, 9 fig., New York, July, 1934.

A good summary accompanies each published part. The velocity of the longitudinal wave, as obtained in the case of direct measurements on large bodies of ice, was found to be 3410 m./sec. Laboratory experiments to obtain the same velocity yielded a value of 3400 m./sec., showing remarkably good agreement.

2274. FAIRCHILD, H. L., "Silencing the 'Guns' of Seneca Lake," *Science*, No. 2050, Vol. 79, 340-341, 1 fig., New York, Apr. 13, 1934.

The same author presents a detailed account of the geological history of the same region in a paper entitled, "Cayuga Valley Lake History" (*Bul. Geol. Soc. Am.*, Vol. 45, No. 2, 233-280, 13 fig., bib., Washington, Apr. 30, 1934).

A paper by O. D. Von Engeln, describing the phenomenon known as the "Cayuga Lake Guns," was reported as No. 93 of the first series of these lists.

See also No. 2287 of this list, and a note by G. R. Wieland which appears in *Science*, No. 2058, Vol. 79, 524-525, New York, June 8, 1934.

2275. FRANZ, Shepherd Ivory and NORRIS, Aileen, "Human Reactions in the Long Beach Earthquake," *Bul. S.S.A.*, Vol. 24, No. 2, 109-114, 1 map, 1 tab., Stanford, Apr., 1934.
2276. GASSMANN, F., "Seismische Bestimmung einer geneigten Grenzfläche von unbekannter Fallrichtung," *Bei. Angew. Geoph.*, Bd. 4, Heft 3, 358-363, 4 fig., Leipzig, 1934.
2277. GERECKE, Friedrich, "Wellentypen, Strahlengang und Tiefenberechnung bei seismischen Eisdickenmessungen auf dem Rhonegletscher," Diss., Math.-Natur. Fak., George August Universität, Göttingen. *Seis. Unter. Geoph. Inst. Gött.*, No. 11, p. 29, 10 fig., bib., Braunschweig, 1933.

2278. GRÄFE, H., "Über die Deformation der Erdoberfläche durch Scherungskräfte im Herd von Erdbeben," *Zeit. Geoph.*, Jahr. 10, Heft 1, 17-26, 14 fig., bib., Braunschweig, 1934.

The above is No. 14 of the series, *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

2279. GREEN, Norman B. and HORNER, A. C., "Joist Anchors in Masonry Walls Tested for Earthquake Resistance," *Eng. N.-R.*, Vol. 113, No. 2, 35-38, 2 fig., 2 tab., New York, July 12, 1934.
2280. HAALCK, Hans, "Lehrbuch der angewandten Geophysik." Gebrüder Borntraeger, vii+376 pp., 142 fig., 6 pl. Price RM 26 (bound). Berlin, 1933.
- Seismic methods are dealt with in Chap. IV (pp. 288-352).

— HAENO, S., ISHIZAKI, M., MIKAWA, I., and AOYAMA, H., "The Fundamental Theory and Practical Application of Seismic Prospecting Method" (in Japanese). See No. 2248 of this list.

— HAGIWARA, Takahiro and ISHIMOTO, Mishio, "The Tsunami Considered as a Phenomenon of Sea Water Overflowing the Land," pp. 17-24 (3 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

2281. HERRMANN, A., "Empfindlichkeitssteigerung bei piezoelektrischen Beschleunigungsmessern," *Bei. Angew. Geoph.*, Bd. 4, Heft 3, 296-301, 3 fig., Leipzig, 1934.

2282. HILLER, W., "Karl Mack," *Zeit. Geoph.*, Jahr. 10, Heft 1, 1-2, Braunschweig, 1934; and also *Ger. Bei.*, Bd. 41, Heft 3, 265-266, portrait, Leipzig, 1934.

The above-listed obituaries review the life and work of the late Dr. Karl Mack who died in Stuttgart-Degerloch at the age of seventy-seven.

2283. HILLER, W., "Seismische Berichte der Württembergischen Erdbebenwarten, Jahrgang 1933," *Veröff. M-g. Ab. Württ. Stat. Land.*, pp. i-iii, 1-68, A1-A19, Stuttgart, 1934.

The above publication, in mimeographed form with printed cover, presents the tabular seismological data for the Württemberg seismograph station on pages 1-68.

The A-pages deal with (A) A review of the microseismic and macroseismic registration for the year, including discussions of particular earthquakes; and (B) Further observations on the registration of the *S*-wave for distances greater than 10,000 km.

W.H.

2284. HILLS, G. F. S., "The Granitic and Basaltic Areas of the Earth's Surface," *Geol. Mag.*, No. 840, Vol. 71, 275-276, London, June, 1934.

On pp. 276-280, Harold Jeffreys presents comment on the above paper under the title, "Note on Mr. Hills' Paper."

- HORNER, A. C. and GREEN, Norman B., "Joist Anchors in Masonry Walls Tested for Earthquake Resistance." See No. 2279 of this list.

2285. HULIN, Carlton D., "Mechanics of Fault Movements," *Pan-Amer. Geol.*, Vol. 61, No. 4, 318, Des Moines, May, 1934.

The above is the abstract only of a paper presented before the Cordilleran Section of the Geological Society of America at its thirty-third annual meeting, held in Berkeley, April 12-14, 1934.

2286. IMAMURA, Akitune, "Chronic Movements of a Minor Crustal Block as Revealed by the Revision of a Levelling Line into one with Closely-spaced Bench-marks," *Proc. Imp. Acad.*, Vol. 10, No. 2, 69-72, 3 fig., Tokyo, Feb., 1934.

- IMAMURA, Akitune, "Past Tunamis of the Sanriku District" (in Japanese with a summary in English), pp. 1-16 (3 maps) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

2287. INGALLS, Albert G., "'Guns' of Seneca Lake," *Science*, No. 2056, Vol. 79, 479-480, New York, May 25, 1934.

See also No. 2274 of this list.

- INOUE, Win, "On Sound Phenomena of the Sanriku Earthquake of March 3rd, 1933" (in Japanese with short summary in English), pp. 77-86 of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

- ISHIMOTO, Mischio and HAGIWARA, Takahiro, "The Tsunami Considered as a Phenomenon of Sea Water Overflowing the Land," pp. 17-24 (3 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

- ISHIZAKI, M., MIKAWA, I., AOYAMA, H., and HAENO, S., "The Fundamental Theory and Practical Application of Seismic Prospecting Method" (in Japanese). See No. 2248 of this list.

2288. JEFFREYS, Harold, "On Errors Due to Variation of Drum-rate," *M. N. Geoph. Surv.*, Vol. 3, No. 6, 213-222, London, May, 1934.

See also No. 2315 of this list.

- JEFFREYS, Harold, "Note on Mr. Hills' Paper, 'The Granitic and Basaltic Areas of the Earth's Surface.'" See No. 2284 of this list.

2289. JEMMA, R., "Le previsioni dei terremoti per mezzo della rivelazione delle perturbazioni elettriche e magnetiche della terra," *Gli Astri, Riv. mens. dell' Assoc. Ital. Astrofili*, Vol. 2, 226, Jul.-Aug., 1933. G.A.

A lengthy abstract in Italian appears on pp. 173-174, *Bol. Soc. Sis. Ital.*, Vol. 31, No. 5-6, Nov., 1933. (Pages 173-183 of the *Bolletín* are devoted to the second and final section of the "Rassegna Sismologica," a valuable bibliography to which reference was made in No. 2132 of these lists).

- KANAI, Kiyoshi and NISHIMURA, Genrokuro, "The Long Wave in a Bay of Variable Section," pp. 182-197 (10 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

2290. KANI, Koichi,

- (1) "The Measurements of the Viscosity of Basalt Glass at High Temperatures, I," *Proc. Imp. Acad.*, Vol. 10, No. 1, 29-32, 3 fig., 3 tab., Tokyo, Jan., 1934.
- (2) "The Measurements of the Viscosity of Basalt Glass at High Temperatures, II," *Ibid.*, No. 2, 79-82, Tokyo, Feb., 1934.

2291. KELLY, J. F., "Geophysics in the Mining and Geological Fields," *Min. Met.*, Vol. 14, No. 1, 30-31, 42, New York, Jan., 1933.

A brief review of the above paper is given over the initials D. W. on page 20 of *Mines Mag.*, Vol. 24, No. 6, Golden, June, 1934.

2292. KIROFF, Kiro P., "Les tremblements de terre en Bulgarie," *Mat. E. Cal.*, No. 32, 341-348, 1 tab., bib., Geneva, 1933.

2293. KOSSMAT, Franz, "Tektonische und Geophysikalische Phänomene in der Ferghana-Region, Zentralasien," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 61-70, Leningrad, 1933. N.V.R.

See also No. 2092 of these lists.

2294. KOZU, S. and UEDA, J.,

- (1) "Thermal Expansion of Basaltic Hornblende," *Proc. Imp. Acad.*, Vol. 10, No. 1, 25-28, 1 fig., bib., Tokyo, Jan., 1934.
- (2) "Thermal Expansion of Augite," *Ibid.*, No. 2, 87-90, 2 fig., 2 tab., Tokyo, Feb., 1934.

2295. KOZU, S., UEDA, J., and TSURUMI, S., "Thermal Expansion of Olivine," *Proc. Imp. Acad.*, Vol. 10, No. 2, 83-86, 1 fig., 3 tab., Tokyo, Feb., 1934.

2296. KRUMBACH, Gerhard, "Über die Aufzeichnung von Fernbeben mit kurzperiodischen Seismometern," *Bei. Angew. Geoph.*, Bd. 4, Heft 3, 263-268, 3 fig., Leipzig, 1934.

2297. KUPRADZE, V. D., "Über die Fortpflanzung der elastischen Schwingungen in festen Medien," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 131-137, Leningrad, 1933.

See also No. 2092 of these lists.

N.V.R.



2298. LACOSTE, Lucien J. B., "A New Type Long Period Vertical Seismograph," *Physics*, Vol. 5, No. 7, 178-180, 5 fig., New York, July, 1934.

The author's abstract reads: "A single spring vertical motion seismograph of theoretically infinite period is described. Actual periods of over a minute have been obtained with a seismograph of this type while for a period of 37 seconds the period was found to be constant to within 1 second for a variation of 9° in the angle between the seismograph arm and the horizontal. A special type of spring is required. The method of winding such a spring is described. A possible method of temperature compensation is given."

2299. LANDSBERG, H., "Zur Laufzeitkurve der  $P_n$ -Welle bei Fernbeben," *Mim. Rep.*, pp. 2, 1 fig., Taunus, 1934.

It may be noted here that a recent letter from Prof. Dr. F. Linke, Director of the Universitäts Institut für Geophysik und Meteorologie, Frankfurt a.M. and of

Reinach'sche Erdbebenwarte des Taunus Observatoriums, announces that the latter subsidiary institution is to be discontinued.

A notification dated May 31, has been received from Dr. Landsberg, to the effect that his address is now School of Mineral Industries, State College, Pennsylvania, U.S.A.

2300. LEE, A. W., "Further Investigations of the Effect of Geological Structure upon Microseismic Disturbance," *M.N., Geoph. Sup.*, Vol. 3, No. 6, 238-252, 4 fig., 6 tab., London, May, 1934.

2301. LEE, Frederick W., "Geophysical Abstracts," No. 60, 1105-1127, Apr.; No. 61, 1128-1152, May; No. 62, 1153-1178, June; No. 63, 1179-1202, July; Washington, 1934. F.W.L.

2302. LEWIS, R. G., "Mechanism of Earth Movements," *Geol. Mag.*, No. 840, Vol. 71, 285-286, 1 fig., London, June, 1934.

A reply by R. G. Lewis to comments by Mr. MacGillavray, published in the above magazine for March, 1934, with regard to an earlier paper by Mr. Lewis reported as No. 2073 of these lists.

2303. LOMBARDINI, Maria, "Il terremoto di Nemi del 26 Dicembre 1927," *Bol. Soc. Sis. Ital.*, Vol. 31, No. 5-6, 136-157, num. tab., Rome, Nov., 1933. G.A.

2304. LYNCH, Joseph, S. J., "Earthquakes: What They Are, How the Scientist Observes Them, and Why They Are Observed," *Scien. Amer.*, Vol. 150, No. 5, 246-248, 4 fig., New York, May, 1934.

2305. MATÉRIAUX POUR L'ÉTUDE DES CALAMITÉS, "Vers une nouvelle victoire de l'homme sur la nature," *Mat. E. Cal.*, No. 32, 353-358, Geneva, 1933.

A short note, signed "Tecnicus," which appeared originally in *Il Messagero*, Rome, Dec. 15, 1933, and which deals with the recent advances in seismology along the line of aseismic construction, etc.

- MATUO, Haruo, "Estimation of Energy of Tunami and Protection of Coasts," pp. 55-64 (10 fig.) of *Sup. Vol. 1, Bul. Eq. Res. Inst.*, and also "Experimental Investigation on

Prevention of Damage of Tunami," pp. 65-76 (35 fig.) of the same publication. See No. 2271 of this list.

2306. MEINESZ, F. A. Vening, "Bemerkungen angesichts des Themas: 'Moderne Geotektonische Theorien, deren physiko-mechanische Grundlagen samt entsprechenden Schlussfolgerungen über die Seismizität,'" *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 91-95, Leningrad, 1933. N.V.R.

See also No. 2092 of these lists.

- MEISSER, O. and SCHMÜCKING, H., "Der Einfluss des Antriebs auf die Schwingungsdauer eines Pendels." See No. 2329 of this list.

- MIKAWA, I., AOYAMA, H., HAENO, S., and ISHIZAKI, M., "The Fundamental Theory and Practical Application of Seismic Prospecting Method" (in Japanese). See No. 2248 of this list.

- MINDLIN, Raymond D., "A Reflection Polariscopes for Photoelastic Analysis." See No. 2346 of this list.

2307. MIYABE, Naomi, "Deformation of the Earth's Crust along the Pacific Coast, Japan Sea Coast and Central Zone of Japan," *Proc. Imp. Acad.*, Vol. 10, No. 5, 364-367, 2 fig., 1 tab., Tokyo, May, 1934.

- MIYABE, Naomi, "An Investigation of the Sanriku Tunami Based on the Mareogram Data," pp. 112-126 (5 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

- MIYABE, Naomi and TERADA, Torahiko, "Revision of Precise Levelling along R. Tenryu, from Simosuwa to Kakegawa, 1934." See No. 2342 of this list.

2308. MÜHLEN, Walter v. zur, "Über seismische Oberflächenwellen und ihre Beziehung zum geologischen Aufbau des eurasiatischen Kontinents," *Zeit. Geoph.*, Jahr. 10, Heft 1, 26-40, 7 fig., bib., Braunschweig, 1934.

The above is No. 13 of the series, *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

2309. MÜLLER, H. K., "Beobachtung der Bodenbewegung in drei Komponenten bei Sprengungen," *Zeit. Geoph.*, Jahr. 10, Heft 1, 40-58, 13 fig., bib., Braunschweig, 1934.

The above is No. 12 of the series, *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

2310. MUSHKETOV, D., "Die nächsten Aufgaben der seismogeologischen Forschung," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 117-124, Leningrad, 1933. N.V.R.

See also No. 2092 of these lists.

- MUSHKETOV, D., "Matériaux séismo-tectoniques," and "Seismical Regions of Central Asia." See respectively as Nos. 2245 (1) and 2245 (2) of this list.

- MUSYA, Kinkiti, "On the Luminous Phenomena that Accompanied the Great Sanriku Tunami in 1933 (Part 1)," pp. 87-111 (2 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

2311. NAGAOKA, Hantaro and SHIRAI, Toshiaki,
- (1) "Continental Margins as Slip-lines: Coasts and Mountain Formations in Shikok as an Example," *Proc. Imp. Acad.*, Vol. 10, No. 1, 13-16, 1 fig., Tokyo, Jan., 1934.
  - (2) "Continental Margins as Slip-lines: Contour of Japanese Islands," *Ibid.*, No. 2, 73-75, 2 fig., Tokyo, Feb., 1934.
  - (3) "Continental Margins as Slip-lines: Boundary Line Common to Some Japanese Volcanoes," *Ibid.*, No. 3, 151-154, 1 fig., Tokyo, Mar., 1934.
- The above are respectively the third, fourth, and fifth communications on this subject by the above authors.
2312. NARYSCHKINA, C. A., Mme., "Die Ullerschen Arbeiten aus dem Gebiete der Wellenkinematik," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 173-178, Leningrad, 1933. N.V.R.
- See also No. 2092 of these lists for a general reference to No. 32 of the publication series. In the above-reported paper Mme. Naryschkina gives her appraisal of the publications of Uller in the field of wave-kinematics. That opinion is frankly critical.
- NASU, Nobuji, "Heights of Tunamis and Damage to Structures," pp. 218-227 (26 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.
2313. NATURE, "Earthquake Seawaves in Northeast Japan," *Nature*, No. 3367, Vol. 133, 728, London, May 12, 1934.
- NISHIMURA, Genrokuro and KANAI, Kiyoshi, "The Long Wave in a Bay of Variable Section," pp. 182-197 (10 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.
- NISHIMURA, Genrokuro and TAKAYAMA, Takeo, "Experimental Study on the Propagation of Tsunami Waves (Part 1)," pp. 232-271 (42 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.
- NORRIS, Aileen and FRANZ, Shepherd Ivory, "Human Reactions in the Long Beach Earthquake." See No. 2275 of this list.
2314. NOWACK, Ernst, "Die südalanischen Erdbeben 1930-1931," *Zeit. Geoph.*, Jahr. 10, Heft 1, 3-17, Braunschweig, 1934.
2315. OBSERVATORY (The), "Geophysical Discussion, Friday, 1934 February 23," *Observatory*, No. 719, Vol. 57, 121-124, London, Apr., 1934.
- The report deals with discussion on the following papers:
- DOODSON, A. T. and CORKAN, R. H., "Load Tilt and Body Tilt at Bidston."
- JEFFREYS, H., "On Errors Due to Variation of Drum-rate."
- STONELEY, R., "The Transmission of Rayleigh Waves in a Heterogeneous Medium."
2316. ODDONE, E. The two following papers are listed, together with a summary of each in Italian, on pp. 174-175 of the bibliography to which reference is made in No. 2289 of this list:
- (1) "Rapporto sull'attività esplicita dall'Italia nel triennio 1930-32 nel campo della sismologia," *Com. Naz. Ital., I.U.G.G., Rapporti sull'attività del Com. nel triennio 1930-32*, p. 73, Padova, 1933.

- (2) "Studio sul terremoto avvenuto il 23 luglio 1930 nell'Irpinia: Relazione presentata a S. E. il Ministro dell'Agric. e delle Foreste, con pratiche conclusioni par la difesa sismica del paese," *La Met. Pratica*, Vol. 13, 16-26; 77-84; 116-125; 171-176; Perugia, 1932. G.A.

— OTUKA, Yanosuke, "Tsunami Damages, March 3rd, 1933, and the Topography of the Sanriku Coast, Japan" (in Japanese with a short summary in English), pp. 127-151 (16 fig.) of Sup. Vol. 1, *Bul. Eq. Res. Inst.* See No. 2271 of this list.

2317. PAGE, Ben M., "Fault-scarps of 1915 in Pleasant Valley, Nevada," *Pan-Amer. Geol.*, Vol. 61, No. 4, 312-313, Des Moines, May, 1934.

The above is the abstract only of a paper presented before the Cordilleran Section of the Geological Society of America at its thirty-third annual meeting, held in Berkeley, April 12-14, 1934.

2318. PASTOR, A. Rey,

- (1) "Datos Sísmicos de la Península Ibérica, Segundo trimestre de 1933," *Ibérica*, No. 995, 3 pp. in reprint, 3 maps, Barcelona, Oct. 21, 1933.  
 (2) "Datos Sísmicos de la Península Ibérica, 3<sup>er</sup> trimestre de 1933," *Ibid.*, 2 pp. in reprint, 1 map.  
 (3) "Datos Sísmicos de la Península Ibérica, 4<sup>o</sup> trimestre de 1933," *Ibid.*, 1 p. in reprint, 1 map. A.R.P.

2319. PERRIN, René, "Reflexions sur la formation de la Terre," *C.R.*, T. 198, No. 1, 105-107, Paris, Jan. 3, 1934.

2320. PROVIERO, A., "La registrazione galvanometrica nel sismografo 'Galitzin,'" *Bol. Soc. Sis. Ital.*, Vol. 31, No. 5-6, 158-172, 5 fig., bib., Rome, Nov., 1933. G.A.

2321. RAMOS DA COSTA, A., "Para a historia de sismologia portuguesa em 1909," *A Terra*, No. 5, Coimbra, July, 1932.

A short summary in Italian appears on page 177 of the bibliography to which reference is made in No. 2289 of this list. G.A.

2322. RAMSPECK, A., "Gebaudeschwingungen durch Erdbeben und Verkehr," *Ingenieurforschung*, Bd. 78, No. 22, 669, Berlin, June 2, 1934. A.R.

2323. ROTHÉ, E., "Rapport sur la propagation des ondes séismiques à courte distance," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 32, 139-168, 14 fig., bib., Leningrad, 1933. N.V.R.

See No. 2092 of these lists for a general reference to No. 32 of the publication series. The above-reported paper terminates with an interesting and suggestive series of "Questions to be Studied."

2324. ROTHÉ, E. and STAHL, P., "Description d'un catalogue de tremblements de terre à fiches de sélection," *66<sup>e</sup> Cong. Soc. Sav., Toulouse, 1933*, No. 87, 479-486, Paris, 1933. J.C.

2325. SALAZAR SALINAS, L., "Los temblores de tierra - su prediccion - precauciones posibles," *A Terra*, No. 1, Oct., 1931; No. 2, Jan., 1932; No. 3, Mar., 1932; No. 4, May, 1932; No. 5, Jul., 1932. Published at Coimbra.



A short summary in Italian appears on pp. 177-178 of the bibliography to which reference is made in No. 2289 of this list. G.A.

2326. SALM, W. C., "Über die Energie der Mintropwelle," *Bei. Angew. Geoph.*, Bd. 4, Heft 3, 364-372, Leipzig, 1934.

2327. SATURNINO, O., "A primeira estação sismologica no Porto (conclusão)," *A Terra*, No. 8, Coimbra, Mar., 1933.

A summary in Italian appears on page 178 of the bibliography to which reference is made in No. 2289 of this list. G.A.

2328. SCARPELLINI, A., "L'impianto di un sismografo 'Agamennone' a pendoli orizzontali nell'Osservatorio di Fano," *La Met. Pratica*, Vol. 14, 254, Perugia, Sept.-Dec., 1933.

A short summary in Italian appears on page 178 of the bibliography to which reference is made in No. 2289 of this list.

2329. SCHMÜCKING, H. and MEISSER, O., "Der Einfluss des Antriebs auf die Schwingungsdauer eines Pendels," *Bei. Angew. Geoph.*, Bd. 4, Heft 3, 258-262, 2 fig., Leipzig, 1934.

2330. SCIENCE NEWS-LETTER. The following short notes of seismological interest have appeared recently in the above publication:

- (1) "Earthquakes of the Week," *S.N.-L.*, No. 681, Vol. 25, 270, Washington, Apr. 28, 1934.
- (2) "Earthquake After-shocks Follow the Moon," and "Severe Earthquake Shakes Alaska," *Ibid.*, No. 684, 313, May 19, 1934.
- (3) "Three Quakes in 36 Hours Keep Seismographs Busy," *Ibid.*, No. 685, 329, May 26, 1934.
- (4) "Plant Life not Harmed by California Earthquake," *Ibid.*, No. 686, 347, June 2, 1934.
- (5) "Kurile Islands Shaken by Quake," *Ibid.*, No. 689, 392, June 23, 1934.
- (6) "Will Make 'Earthquakes' to get Data on Real Ones," *Ibid.*, Vol. 26, No. 691, 9, July 7, 1934.
- (7) "Earthquake Rocks Sea Floor in Caribbean," *Ibid.*, No. 693, 46, July 21, 1934.
- (8) "Greatest Concentration of Earthquakes for Years," *Ibid.*, No. 694, 54, July 28, 1934.

2331. SCIENTIFIC AMERICAN,

- (1) "Testing 'Earthquake-proof' Structures," *Scien. Amer.*, Vol. 150, No. 5, 256-257, 1 fig., New York, May, 1934.

A short editorial reporting the details of a "stress recorder" developed at the Mass. Inst. Tech. by A. C. Ruge, research associate in seismology in the department of civil engineering.

- (2) "Splitting Seconds," *Ibid.*, Vol. 151, No. 1, 16-17, New York, July, 1934.

A popular article with four illustrations. It was contributed through the courtesy of Electrical Research Products, Inc., and treats of the crystal control methods of measuring time.

2332. SCRASE, F. J., "Modern Seismology," *Sc. Prog.* No. 113, Vol. 29, 41-51, London, July, 1934.

The above paper is in the form of an extended review of the *Bulletin on Seismology*, reported as No. 2076 of these lists.

2333. SHEPARD, Francis P., "American Submarine Canyons," *Scot. Geog. Mag.*, Vol. 50, No. 4, 212-218, 5 fig., Edinburgh, July, 1934.

2334. SHEPPARD, George, "Small Sand Craters of Seismic Origin," *Nature*, No. 3348, Vol. 132, 1006, London, 1933.

— SHIRAI, Toshiaki and NAGAOKA, Hantaro, "Continental Margins as Slip-lines, etc." Three communications reported as No. 2311 of this list.

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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.

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Under the last heading are presented abstracts or titles of papers by Stechschulte, Fleming, (Leet), Bradford, Sohon, Lynch, Heck, Howells, (Rutherford), (Chick), Creskoff, Ruge, Neumann, Leggette and Taylor, Gilbert, Wenner, Weed, Pekeris, Brunner, Blake, Ewing and Crary, Dahm, (Wenner and McComb), and Buckley. These will be found indexed in this issue of the *Bibliography* as cross-references under the respective names.

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F.D.H.

2395. EWING, Maurice and CRARY, A. P., "Study of Emergence Angle and Propagation Paths of Seismic Waves," *Physics*, Vol. 5, No. 10, 317-320, 7 fig., New York, Oct., 1934.

A new method for measurement of the emergence angle has been used and the values obtained from field data agree reasonably well with those deduced from theoretical treatment of the time-distance curve, assuming that the velocity increases continuously with the depth.

For abstract of a paper by the above authors entitled: "Experiments on Emergence Angle and Propagation Paths," see p. 20 of *Earthquake Notes* reported as No. 2366 of this list.

2396. EWING, Maurice, CRARY, A. P., and LOHSE, J. M., "Seismological Observations on Quarry-Blasting," *Trans. A.G.U., Ann. Mtg., 1934*, 91-94, 3 fig., Washington, June, 1934.

2397. FAKIDOV, Ibrahim, "Vibrations of the Ice-cap of Polar Seas," *Nature*, No. 3388, Vol. 134, 536-537, London, Oct. 6, 1934.

The author reports the vibrations of the ice-cap observed during his polar expedition on the ss. *Cheluskin* in the Chukchi Sea, 1933-34. There were apparently constant vibrations present in the ice but suitable instruments were not available for making records. He adds that: "A few cases of considerable vibrations running in a determined direction were observed on a windless day. Some hours later (up to eight hours) the wind blew in that same direction; evidently it did not keep pace with the sound oscillations it had created in the ice."

2398. FALCÃO, Machado F., "As fossas de plataforma continental portuguesa," *A Terra*, No. 13, Coimbra, Mar., 1934.

A brief summary by Agamennone appears, in Italian, on pages 37-38, of *Bol. Soc. Sis. Ital.*, Vol. 32, No. 1-2, Rome, 1934.

G.A.

- FLEMING, J. A., "Communication Regarding Huancayo Seismograph Station." See No. 2366 of this list.
2399. FUENZALIDA, H., "Sismicidad de Chile durante el año de 1932," *Bol. Sis. Univ. Chile*, No. 24, 1934.  
A brief summary by Agamennone appears, in Italian, on page 38 of *Bol. Soc. Sis. Ital.*, Vol. 32, No. 1-2, Rome, 1934. G.A.
2400. FUJIWARA, S., TSUJIMURA, T., and KUSAMITSU, S., "On the Earth-Vortex, Echelon Faults, and Allied Phenomena." Reprint from: *Ergebnisse der Kosmischen Physik*, Bd. 2, Akademische Verlagsgesellschaft, m.b.H., 570 pp., 50 fig., Leipzig, 1934.  
A review by Gordon Rittenhouse appears on page 668 of *Jour. Geol.*, Vol. 42, No. 6, Chicago, Aug.-Sept., 1934.
2401. FUKUTOMI, Takaharu,  
(1) "On the Vibration of Buildings and Reinforced Concrete Chimneys due to Earthquake Motion," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3, 492-516, 22 fig., Tokyo, Sept., 1934.  
(2) "Report of the Strong Idu Earthquake of March 21, 1934," *Ibid.*, 527-538, 7 fig.  
The second paper is in Japanese with a short summary in English.
2402. GATTY, O., "Appendix II: Report on the Geophysical Seismograph (The Oxford University Expedition to Spitsbergen, 1933)," *Geog. Jour.*, Vol. 84, No. 2, 121-122, London, Aug., 1934.
2403. GHERZI, E.,  
(1) "Note sur le séismographe horizontal Wilip-Galitzine de 2.3 sec. de période," *U.G.G.I., Ass. Séis., Trav. Sc.*, Sér. A, Fasc. 10, 28-30, Strasbourg, 1934.  
(2) "Note sur la composante vertical Galitzine," *Ibid.*, 31-33.  
Presented at the Lisbon Congress, 1933.
- GILBERT, Roswell W., "An Application of Vacuum-tube Amplification to Indicators and Recorders" (abstract only). See No. 2366 of this list.
2404. GUTENBERG, B., WOOD, Harry O., and BUWALDA, John P., "Experiments Testing Seismographic Methods for Determining Crustal Structure," *Bul. S.S.A.*, Vol. 22, No. 3, 185-246, 11 fig., 13 tab., Stanford, Sept., 1932.
2405. GYLLENBERG, M., "Le séismographe de l'Observatoire de Lund," *U.G.G.I., Ass. Séis., Trav. Sc.*, Sér. A, Fasc. 10, p. 34, Strasbourg, 1934.  
Presented at the Lisbon Congress, 1933.
2406. HAGIWARA, Takahiro, "Earthquakes and Earthsounds on Mt. Tukuba," *Bul. Eq. Res. Inst.*, Vol. 12, Part 2, 222-233, 7 fig., Tokyo, June, 1934.
2407. HAGIWARA, Takahiro, "On the Magnetic Damper," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3, 482-491, 9 fig., Tokyo, Sept., 1934.



2408. HECK, N. H., "Seismological Progress-Report," *Trans. A.G.U., Ann. Mtg., 1934, Part 1*, 58-61, Washington, June, 1934.

— HECK, N. H., "World Distribution of Earthquake Epicentres and Seismic Sea Waves" (abstract only). See No. 2366 of this list.

— HECK, N. H. and NEUMANN, Frank, "Progress of Seismological Investigations in the United States between July 1, 1930 and June 30, 1933." See pp. 218-221 of the *Proceedings of the Lisbon Conference*, reported as No. 2470 of this list.

— HIDAKA, S. and KADOYA, K., "On the  $S_s$  Wave of Deep-focus Earthquakes Observed near the Epicentre." See No. 2415 of this list.

— HOSMER, George L., "The Determination of Earthquake Stresses in Elastic Structures by Means of Models (Foreword)." See No. 2472 of this list.

— HOWELLS, J., "Construction of an Azimuthal-equidistant Projection for Seismograph Station Uses" (abstract only). See No. 2366 of this list.

— HUGHES, J. S. "Introduction to the International Seismological Summary for the first quarter of 1930." See No. 2458 of this list.

2409. HULL, Callie and WEST, Clarence J., "Funds Available in the United States for the Support and Encouragement of Research in Science and its Technologies," N.R.C. (U.S.A.), Bul. No. 95, 162 pp., Washington, 1934.

The various funds available for research in seismology are indexed on page 158.

2410. IMAMURA, Akitune, "Further Notes on the Northward Movement of Crustal Deformation along the Western Boundary of the Kwanto Plain with Special Reference to the Block Movement Responsible for the Disastrous Earthquake of September 21, 1931," *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 3, 95-112, 6 fig., 10 tab., Tokyo, 1934. A.I.

2411. IMAMURA, Akitune and KAWASE, Ziro, "A New Volcano off the East Coast of Alaid Island," *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 3, 113-116, 5 fig., Tokyo, 1934. A.I.

2412. ISHIMOTO, Mishio, "Observations accéléro-métriques des secousses sismiques dans les villes de Tôkyô et Yokohama (premier rapport)," *Bul. Eq. Res. Inst.*, Vol. 12, Part 2, 234-248, 8 fig., Tokyo, June, 1934.

The paper is in Japanese except for a short summary in French on page 248.

2413. JAPANESE JOURNAL OF ASTRONOMY AND GEOPHYSICS. In Vol. 11, No. 3, of the above periodical, beginning on page (48) of the section devoted to abstracts, appear a series of notices of papers printed in Japanese in the first volume of *Disin* (1929). They are signed F. K. in each case and include papers by Matuzawa, Imamura, Nasu, Kodaira, Sumitani, Kishinouye, Haeno, Otuka, Kosikawa, Fukutomi, Kawase, and Ishimoto.

2414. JEFFREYS, Harold, "State of the Earth's Central Core," *Nature*, No. 3383, Vol. 134, p. 324, London, Sept. 1, 1934.

A discussion of the short article by L. Bastings, reported as No. 2363 of this list.

- JEFFREYS, Harold,
- (1) "Recommendation on the Notation for Pulses in Near Earthquakes." See pp. 230-231 of the *Proceedings of the Lisbon Conference*, reported as No. 2470 of this list.
  - (2) (with K. E. Bullen) "Revision of Seismological Tables." *Ibid.*, p. 225-227.
- JEFFREYS, Harold and BULLEN, K. E., "Travel-time Tables." See No. 2458 of this list.
- JUNG, Heinrich, "Berechnung der Laufzeitkurven des anormalen Schalles für Windstille Atmosphäre und Vergleich mit der Laufzeitkurve der Oldebroek-Sprengung vom 15 Dezember, 1932." See No. 2506 of this list.
2415. KADOYA, K. and HIDAKA, S., "On the  $S_0S$  Wave of Deep-focus Earthquakes Observed near the Epicentre," *Geoph. Mag.*, Vol. 8, No. 1, 73-76, 2 fig., 1 tab., Tokyo, July, 1934. See also No. 2445 of this list.
- KANAI, Kiyoshi and NISHIMURA, Genrukuro, "On the Effect of Discontinuity Surface upon the Propagation of Elastic Waves. Parts III, IV, V." See No. 2454 of this list.
- KANAI, Kiyoshi and SEZAWA, Katsutada,
- (1) "On the Propagation of Waves along a Surface Stratum of the Earth."
  - (2) "Reflection and Refraction of Seismic Waves in a Stratified Body." See No. 2481 of this list.
- KAWASE, Ziro and IMAMURA, Akitune, "A New Volcano off the East Coast of Alaid Island." See No. 2411 of this list.
2416. KAWASUMI, Hiroshi and YOSIYAMA, Ryoiti, "On the Mechanism of a Deep-seated Earthquake as Revealed by the Distribution of the Initial Motions at Stations Throughout the World," *Proc. Imp. Acad.*, Vol. 10, No. 6, 345-348, 2 fig., Tokyo, June, 1934.
- KESSLER, William W., "Report of Disturbance by Earthquake while Observing." See page four of *Earthquake Notes*, reported as No. 2366 of this list.
2417. KISHINOUE, Fuyuhiko, "Harmonic Analysis of Damped Vibrations," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3, 446-450, 8 fig., Tokyo, Sept., 1934.
2418. KOBER, L.,
- (1) "Der Bau der Erde" (Second edition), Gebrüder Borntraeger, pp. 500, 100 fig., 2 tab. Price RM 30.00. Berlin, 1928.
  - (2) "Die Orogentheorie: Grundlinien eines natürlichen Gestaltungsbildes der Erde," *Ibid.*, pp. 184. 50 fig. Price RM 16.00. Berlin, 1933. F.W.L.
2419. KOENIGSBERGER, J., "Angaben und Urteile über die Leistungen der angewandten Geophysik in Russland," *Bei. Angew. Geoph.*, Bd. 4, Heft 2, 222-234, Leipzig, 1934.
- An abstract by W. Ayvazoglou appears as Item 1964, pp. 1170-1171, *Geoph. Abs.*, reported as No. 2301 of these lists. F.W.L.

— KÖLZER, Joseph, "Zur Frage der anormalen Schallausbreitung." See No. 2506 of this list.

2420. KONSTANTINOV, A.P. Russian Patent No. 105846, issued July 31, 1933. This invention relates to an electrical seismograph consisting of a generator and a resonance body. The capacity of the latter is so arranged that it can be changed by the effects of the shocks. Claims allowed—1. F.W.L.

2421. KUMAGAI, Naoiti, "Density Distribution and Compressibility in the Earth's Crust and Compensating Density after Pratt's Hypothesis on Isostasy. Part I," *Jap. Jour. Ast. Geoph.*, Vol. 11, Part 3, 117-135, 5 tab., bib., Tokyo, 1934.

2422. KUNITOMI, Sin'iti, "Note on the Propagation of Earthquake Waves of near Origin in Japan" (in Japanese), *Jour. Met. Soc. Jap.*, Vol. 4, 117-123, Tokyo, 1934.

An abstract by the author, written in English, appears on pages (54) and (55) of the section devoted to abstracts in the *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 3, Tokyo, 1934. The paper presents evidence to support the statement by the author that the velocity of a seismic condensational wave propagated in the direction perpendicular to the arc of the Japanese islands is greater than that of a wave propagated along it. The above is the fourth report on the same subject by this author.

— KUSAMITSU, S., FUJIWHARA, S., and TSUJIMURA, T., "On the Earth-Vortex, Echelon Faults, and Allied Phenomena." See No. 2400 of this list.

2423. LABROUSTE, H. et Mme. LABROUSTE,

(1) "Analyse d'ondes séismiques," *U.G.G.I., Ass Séis., Trav. Sc.*, Sér. A, Fasc. 10, 35-40, 2 fig., Strasbourg, 1934.

(2) "Variations périodiques de l'agitation microséismique," *Ibid.*, 41-44, 1 fig.

Presented at the Lisbon Congress, 1933.

2424. LACOSTE, J.,

(1) "Observations sur le mouvement microséismique à Strasbourg au cours des années 1930-1931-1932," *U.G.G.I., Ass. Séis., Trav. Sc. Sér. A*, Fasc. 10, 45-48, 1 fig., 2 tab., Strasbourg, 1934.

(2) "Étude d'une agitation microséismique anormale, 13 novembre 1930," *Ibid.*, 49-53, 1 fig., 4 tab.

Presented at the Lisbon Congress, 1933.

2425. LACOSTE, J. and ROTHÉ, J.P., "Les tremblements de terre en France, de 1930 à 1933," *C.R.*, T. 199, No. 4, 305-307, July, 1934.

The summary by the authors reads: "This note, concerning the earthquakes felt in France from 1930 to 1933, deals with their geographical distribution. It continues, together with our similar notes previously published, the seismic history for France."

J.C.

2426. LANCASTER-JONES, C., "Rapid Adjustment of Observations in Network of Geophysical Stations by the Method of Least Squares," *Proc. Phys. Soc.*, Vol. 45, 792-807, London, Nov. 1, 1933.

- The author's abstract is quoted as Item 2074, p. 1230, reported as No. 2428 of this list. F.W.L.
2427. LANDSBERG, H., "Die Entstehung der Erdbeben," *Natur und Volk*, Bd. 64, Heft 9, 363-368, fig., Frankfurt a.M., Sept., 1934. H.L.+R.R.B.
2428. LEE, Frederick W., "Geophysical Abstracts," No. 64, 1203-1226, Aug.; No. 65, 1227-1245, Sept.; No. 66, 1246-1265, Oct.; Washington, 1934. F.W.L.
2429. LEE, Frederick W., "Some Comments on Applied Geophysics, 1933," *Ter. Mag. At. Elec.*, Vol. 39, No. 2, 127-131, Baltimore, 1934.
2430. LEET, L. Don, "Analysis of New England Microseisms," *Ger. Bei.*, Bd. 42, Heft 2-3, 232-245, 2 fig., 1 tab., Leipzig, 1934.
- The author's summary reads, "The motion of an earth particle in the path of microseisms was analysed from Harvard Seismograph Station records. Longitudinal and transverse waves were identified. No Rayleigh waves were found. Nothing in the analysis shows whether the transverse are surface or body waves. Waves from SE, E, and NE have been isolated on the Harvard records. Evidence favors storm waves in large bodies of water as the cause, whether they beat upon rock coasts or not. Correlations with nine cyclonic storms are listed in detail." See also No. 2366 of this list. L.D.L.
2431. LEET, L. Don, "Some Phases on Explosion Records in a Three-layered Region," *Ger. Bei.*, Bd. 42, Heft 2-3, 246-251, 2 fig., Leipzig, 1934. L.D.L.
- LEGGETTE, R. M. and TAYLOR, G. H., "Earthquakes Instrumentally Recorded in Artesian Wells" (abstract only). See No. 2366 of this list.
2432. LEHMANN, Mlle. I., "Transmission Times for Seismic Waves for Epicentral Distances around 20°," *Geodætisk Institut Meddelelse*, No. 5, 45 pp., 31 fig., 11 tab., Copenhagen, 1934.
- This important contribution to the subject indicated in the title is based on an intensive study of the Iceland earthquake of July 23, 1929, and the Azores earthquake of May 20, 1931. The curvature of the travel-time curve for *P* is found to be discontinuous around 20°. Comparison of the travel-time curve deduced by Miss Lehmann with those which had been published up to the time this work was done in 1932 are made in detail and the seismogram sections on which the work of this paper are based are reproduced.
- LOHSE, J. M., EWING, Maurice, and CRARY, J. M., "Seismological Observations on Quarry-Blasting." See No. 2396 of this list.
2433. LYNCH, Joseph, S.J., "Hunting Earthquakes," *Sc. Month.*, Vol. 39, No. 5, 458-461, New York, Nov., 1934.
- The text of a Science Service Radio Talk, presented over the Columbia Broadcasting System.
- LYNCH, Joseph, S.J., "Earthquakes of 1933-1934" (abstract only). See No. 2366 of this list.



2434. MACELWANE, James B., S.J., "Report of the Jesuit Seismological Association for 1933," *Trans. A.G.U., Ann. Mtg. 1934*, Part 1, 62-64, 2 maps, Washington, June, 1934. J.B.M.

— MACELWANE, James B., S.J.,

- (1) "Report of the Jesuit Seismological Association." See pp. 221-222 of the *Proceedings of the Lisbon Conference*, reported as No. 2470 of this list.  
 (2) "New Tables of Travel Times for Earthquakes of Normal Focal Depth." *Ibid.*, pp. 231-236.

2435. MARSH, G. Everett, "The Constitution of the Earth," *Ger. Bei.*, Bd. 42, Heft 4, 430-446, 5 fig., Leipzig, 1934.

The author's summary is printed at the beginning of the paper. In it he states: "The location of the discontinuity in structure between the core and the basaltic layer is in agreement with the results of seismic study." On page 441 of the text he writes: "Seismologists have indicated surfaces of discontinuities at depths of 1,200, 1,400, 1,422, 1,500, 1,600, 1,700, 1,712, 1,740 kms. It appears reasonable that these values refer not to eight surfaces within a distance of 540 kms., but to only one. The mean of these values is 1,560 kms., . . . The mean of the last four is 1,680 kms. . . . These means are to be compared with our value 1,663 kms. and it is seen that there is an agreement that is not without considerable interest." Seismologists will be interested in this "agreement" between the adopted depth to the core discontinuity and the average value of the seismic data selected by the author. The latter further simplifies his analysis by averaging selected values of seismically-determined discontinuities to define the boundary between the granitic and the basaltic layers at a depth of 510 kms!

E.A.H.

2436. MARTEL, R. R., "Influence of Static Stresses on Earthquake Damage to Buildings," *Bul. S.S.A.*, Vol. 22, No. 3, 247-249, 1 fig., Stanford, Sept., 1932.

— MARTIN, H. and MEISSER, O., "Beiträge zu den Luftschallmessungen." See No. 2506 of this list.

— McCOMB, H. E. and WENNER, Frank, "Preliminary Report on Shaking-table Tests of Teleseismic Instruments" (title only). See No. 2366 of this list.

2437. MEINESZ, F. A., Vening, "Gravity and Hypothesis of Convection Currents," *Proc. K. Akad.*, Vol. 37, No. 2, 37-45, Amsterdam, 1934.

For an abstract of this paper, signed C.A.S., see *Sc. Abst. A.*, Vol. 37, No. 437, London, 1934; or *Geoph. Abs.*, No. 2072, p. 1229, (see No. 2428 of this list). F.W.L.

2438. MEISSER, O., "Zur photographischen Registrierung von Stationsseismometern," *Zeit. Geoph.*, Jahr. 10, Heft 5-6, 259-265, 7 fig., 1 tab., Braunschweig, 1934.

— MEISSER, O. and MARTIN, H., "Beiträge zu den Luftschallmessungen." See No. 2506 of this list.

2439. MERRITT, G. E., "Installation of Tiltmeters," *Trans. A.G.U., Ann. Mtg., 1934*, 65-69, 4 fig., Washington, June, 1934.

## 2440. MICHLIN, S.,

- (1) "Über die Verteilung von Spannungen in einer Halbebene mit elliptischer Öffnung," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 35, 17 pp., 3 fig., Leningrad, 1934.
- (2) "La solution du problème plan biharmonique et des problèmes de la théorie statique d'élasticité à deux dimensions," *Ibid.*, No. 37, 26 pp.
- (3) "Méthode des approximations successives dans le problème biharmonique," *Ibid.*, No. 39, 14 pp.

The first of the above papers is in Russian with a short summary in German; the second is in French with a lengthy summary in Russian; the third is wholly in Russian.

2441. MIHAILOVIĆ, J., "Annuaire Microséismic:" Année XII, 1932, 41 pp., 4 pl.; Année XIII, 1933, 40 pp.; *Pub. Inst. Seis. Univ. Beograd*, 1934.2442. MILANKOVITCH, M., "Der Mechanismus der Polverlagerungen und die daraus sich ergebenden Polbahnkurven," *Ger. Bei.*, Bd. 42, Heft 1, 70-97, 4 fig., 2 tab., Leipzig, 1934.

## 2443. MIYABE, Naomi,

- (1) "Notes on Correlation between Vertical Earth Movements and Gravitational Anomalies," *Bul. Eq. Res. Inst.*, Vol. 12, Part 2, 163-173, 5 fig., Tokyo, June, 1934.
- (2) "Experimental Investigation of the Deformation of Sand Mass, Part IV," *Ibid.*, 195-213, 57 fig.

## 2444. MIYABE, Naomi,

- (1) "Deformation of the Earth's Crust along the Pacific Coast, the Japan Sea Coast, and in the Central Zone of Japan," *Bul. Eq. Res. Inst.*, Vol 12, Part 3, 460-470, 9 fig., Tokyo, Sept., 1934.
- (2) "Deformation of the Earth's Crust in the Neighbourhood of Sakurazima," *Ibid.*, 471-481, 8 fig.

The second paper is in Japanese with a long summary in English.

2445. MIYAMOTO, M., "On the  $S_pS$  Waves of Deep-focus Earthquakes Observed near the Epicentre and Their Applications," *Geoph. Mag.*, Vol. 8, No. 1, 77-101, 5 fig., 4 tab., Tokyo, July, 1934. See also No. 2415 of this list.2446. MUCHKETOFF, D., "Il terremoto Irpino del 23 Luglio 1930," *Bol. Sis. Soc. Ital.*, Vol. 32, No. 3-4, 79-82, Rome, 1934. G.A.2447. MUSKETOV, D., "Materiaux seismo-tectoniques: Livr. 1 et 2," *Pub. Inst. Séis., Acad. Sc. URSS.*, Nos. 33 and 34, 17 pp., 1 pl., and 59 pp., 1 tab., 1 pl., Leningrad, 1933.

The paper is in the Russian language.

N.V.R.

## — NAKAGAWA, J., TAKEDA, K., and NAKANO, M., "Preliminary Report of a Result of Experiment on the Accumulation and Dissipation of Energy of the Secondary Undulations in a Bay." See No. 2449 of this list.

2448. NAKANO, Masito, "On the Effect of Prevailing Winds upon the Depth of Bays," *Proc. Imp. Acad.*, Vol. 10, No. 6, 334-337, 1 fig., Tokyo, 1934. M.N.

2449. NAKANO, M., NAKAGAWA, J., and TAKEDA, K., "Preliminary Report of a Result of Experiment on the Accumulation and Dissipation of Energy of the Secondary Undulations in a Bay," *Geoph. Mag.*, Vol. 8, No. 1, 121-124, Tokyo, 1934. M.N.

2450. NARYSHKINA, C., "Sur un problème mixte de la théorie de la propagation des ondes," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 38, 11 pp., Leningrad, 1934.

The paper is in the Russian language. N.V.R.

2451. NAVARETTE, J. Bustos, "Étude sur les séismes," *U.G.G.I., Ass. Séis., Trav. Sc.*, Sér. A, Fasc. 10, 12-16, Strasbourg, 1934.

Presented at the Lisbon Congress, 1933.

2452. NAVARRO, José Rodriguez, "Notaciones sismológicas propuesta hecha a la Sección de Sismología de la 5ª conferencia de la Unión Geodésica y Geofísica Internacional," *U.G.G.I., Ass. Séis., Trav. Sc.*, Sér. A, Fasc. 10, 91-94, 18 fig., Strasbourg, 1934.

Presented at the Lisbon Congress, 1933.

— NEUMANN, Frank,

(1) "A Practical Method of Integrating Acceleration Curves,"

(2) "A Further Note on the Interpretation of Travel-time Curves."

The above appear as abstracts only on pages 15-16 and 20-21 respectively of *Earthquake Notes*, reported as No. 2366 of this list.

— NEUMANN, Frank and HECK, N. H., "Progress of Seismological Investigations in the United States between July 1, 1930, and June 30, 1933." See pp. 218-221 of the *Proceedings of the Lisbon Conference*, reported as No. 2470 of this list.

2453. NISHIMURA, Genrokuro, "On the Vibration of a Heterogeneous Elastic Solid due to the Surface Force (I)," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3, 368-425, 1 fig., Tokyo, Sept., 1934.

The paper is in Japanese with a brief summary in English.

2454. NISHIMURA, Genrokuro and KANAI, Kiyoshi, "On the Effect of Discontinuity Surface upon the Propagation of Elastic Waves. Parts III, IV, V," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3; 277-316, 22 fig.; 318-330, 6 fig.; 331-367, 19 fig.; Tokyo, Sept., 1934.

The papers are in Japanese with very brief summaries in English.

2455. NOVOTORZEV, V. I., "Vibration Problems in Designing Earthquake-proof Construction," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 43, 104 pp., 37 fig., 8 tab., bib., index, Leningrad, 1934.

The paper is in the Russian language. N.V.R.

## 2456. ODDONE, E.,

- (1) "Quelques resultats sur la prospection séismique du sous-sol profond italien," *U.G.G.I., Ass. Séis., Trav. Sc., Sér., A, Fasc. 10, 77-79, Strasbourg, 1934.*
- (2) "Au sujet de l'influence des accidents de la croute terrestre sur les hodochrones et sur l'aspect des séismographes," *Ibid., 80-82.*
- (3) "Sur les valeurs que prend l'accélération dans le sol et dans les batiments," *Ibid., 83-86.*

Presented at the Lisbon Congress, 1933.

— ODDONE, E., "Inaugural Address of the Temporary President of the Seismological Association." See pp. 163-171 of the *Proceedings of the Lisbon Conference*, reported as No. 2470 of this list.

2457. OTUKA, Yanosuke, "Tertiary Structures of the Northwestern End of the Kitakami Mountainland, Iwate Prefecture, Japan," *Bul. Eq. Res. Inst., Vol. 12, Part 3, 566-638, 1 fig., 1 map, 6 tab., 8 pl., Tokyo, Sept., 1934.*

2458. OXFORD UNIVERSITY, "International Seismological Summary, Jan., Feb., Mar., 1930," 73 pp., Oxford, 1934.

The above first issue for the year 1930 is preceded by an eighteen-page introduction prepared by J. S. Hughes, comprising the following matter: Introduction, Method of determination, Table giving depth of focus in decimals of earth's radius, Travel-time tables from 0° to 180° showing values for *P, PP, P<sub>s</sub>P, PS, P', PKS, P'<sub>2</sub>, S, SS, S<sub>s</sub>S, SKS, SKKS, SKSP*, at intervals of one degree. The travel-time tables were prepared by Harold Jeffreys and K. E. Bullen. They are followed on the last page of the introduction section by a series of notes. The sections of the curves which require special investigation are noted. It is stated that a limited number of mimeographed copies giving the values to tenths of seconds are available for those undertaking a study of special earthquakes.

2459. PASTOR, A. Rey, "Datos sísmicos de la península Ibérica," *Ibérica*, No. 1036, Vol. 42, sup. p. xiii, Barcelona, Aug 4, 1934.

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The author's summary reads: "It is shown that the variation with depth of the density and elastic constants of a half-space can be determined from the observed motion of the surface caused by a given distribution of stresses on the surface."

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The table of contents of the translation section includes, in part, the following: Address of the temporary president (E. Oddone), Report of the General Secretary (E. Rothé), Report on the question of time-curves (E. Rothé), On the publication of new travel-time tables (O. Somville), Discussions *re* subsidies to the International Seismological Summary and to the *Bureau International de l'Heure*, Progress report for seismological investigations in the United States (N. H. Heck, F. Neumann, J. B. Macelwane, S.J.), Report on the telegraphic transmissions (E. Rothé), Revision of seismological tables (H. Jeffreys and K. E. Bullen), Recommendation on the notation for pulses in near earthquakes (H. Jeffreys), New tables of travel-times for earthquakes of normal focal depth (J. B. Macelwane, S.J.), Summary report on the work of the Association (E. Rothé).

The eight appendixes deal in order with: Agenda for the conference, Reports of the General Secretary, The International Seismological Summary, Reports of the various adhering countries, Code for earthquake telegrams (Science Service Research Aid Announcement), Additions to the library of the Association, Proposed new statutes, and Publications deposited in the Central Bureau of the Association of Seismology.

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The tectonic structure of South-Sumatra (in connection with the earthquake of June 25, 1933): The author concludes that: the Semangko-fault is a longitudinal rift valley, a series of volcano-tectonic depressions; the epicentre of the earthquake of June 25, 1933, coincides with this rift valley and the earthquake was the result of tension; the tectonic movements which take place in South-Sumatra can be compared with those occurring in the southwestern United States. J.F.S.

2498. VON SCHMIDT, Oswald, "Über die totalreflexion in der Akustik und Optik," *Ann. Phys.*, Bd. 19, Heft 8, 891-912, Leipzig, 1934.

On pages 913-920 of the same issue of the above publication Johannes Picht presents a discussion of the article by von Schmidt, under the title: "Nachschrift zur Arbeit des Herrn von Schmidt."

An abstract on the two papers is given as No. 2815, p. 673, of *Sc. Abst. A.*, Vol. 37, No. 439, London, July 25, 1934.

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A review by the author, written in English, appears on page (53) of the section devoted to abstracts in the *Jap. Jour. Ast. Geoph.*, Vol. 11, No. 3, Tokyo, 1934.

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2500. WENNER, Frank *et al.*, "Report of the Section of Seismology of the American Geophysical Union to the Association of Seismology of the International Union of Geodesy and Geophysics, 1933," *U.G.G.I., Ass. Séis., Trav. Sc., Sér. A, Fasc. 10*, 54-76, Strasbourg, 1934.

This report is divided into nine sections dealing respectively with the following subjects: (1) Introduction, (2) Progress in seismology in the United States, (3) Improved international radio time-service, (4) New or improved seismological instruments or methods, (5) Geophysical-prospecting instruments and methods, (6) Studies in wave transmission (by James B. Macelwane, S.J.), (7) Investigation of strong seismic motion, (8) Engineering aspects of seismology, (9) Location of new seismic stations for general and special studies.

Dr. Wenner is Chairman of the Executive Committee of the Section of Seismology of the American Geophysical Union, making this report. The Vice-Chairman is Dr. F. W. Lee and the Secretary is Mr. H. E. McComb.

In lieu of presenting the material of section (2) of the above report in full, reference is made to an attached progress report prepared by N. H. Heck and Frank Neumann of the United States Coast and Geodetic Survey, Washington. The report is indexed as the last cross reference to N. H. Heck of this list.

— WENNER, Frank, "Basic Principles of Seismological Instruments" (title only). See No. 2366 of this list.

— WENNER, Frank and McComb, H. E., "Preliminary Report on Shaking-table Tests of Teleseismic Instruments" (title only). See No. 2366 of this list.

— WEST, Clarence J. and HULL, Callie, "Funds Available in the United States for the Support and Encouragement of Research in Science and its Technologies." See No. 2409 of this list.

2501. WHIPPLE, F. J. W., "Notes on Mr. A. W. Lee's Investigation, 'A World-wide Survey of the Microseismic Disturbances Recorded During the Month of January, 1930.'" *U.G.G.I., Ass. Séis., Trav. Sc., Sér. A, Fasc. 10, 127-135, Strasbourg, 1934.*

The above paper was presented at the Lisbon Congress, 1933. On page 135 the statement is made that: "Whilst the foregoing remarks may serve to clear up the mathematical difficulties encountered by the hypothesis that microseisms are due to sea waves, it is by no means certain that the hypothesis is valid. It has been mentioned that Lee finds that of the two Atlantic cyclones, equal in intensity and in almost the same position, one may produce microseisms of much greater amplitude than the other . . . . . Until an adequate explanation of such occurrences is found no final verdict on the question of how microseisms are generated will be possible."

A considerable collection of data, covering investigations for several years into the microseisms recorded at the Dominion Observatory, Ottawa, presents many anomalies similar to those outlined above. The reviewer is quite in accord with the verdict of the quoted paragraph. E.A.H.

— WÖLCKEN, K., "Schalluntersuchungen in Polargebiet." See No. 2506 of this list.

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2503. WOOD, Harry O., "Earthquakes in California," *Sc. Month., Vol. 39, No. 4, 323-344, 13 illus., 7 fig., New York, Oct., 1934.*

The author has brought to bear on this subject his long years of experience with earthquakes and earthquake study in California and has produced a most interesting, accurate, and informative article which is thoroughly up-to-date.

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2504. YABE, Hisakatsu and TAYAMA, Risaburo, "Bottom Relief of the Seas Bordering the Japanese Islands and Korean Peninsula," *Bul. Eq. Res. Inst.*, Vol. 12, Part 3, 539-565, 17 fig., Tokyo, Sept., 1934.

The paper is in Japanese but there is a full three-page summary in English and the maps are most informing.

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— YOSIYAMA, Ryoiti and KAWASUMI, Hiroshi, "On the Mechanism of a deep-seated Earthquake as Revealed by the Distribution of the Initial Motions at Stations Throughout the World." See No. 2416 of this list.

2506. ZEITSCHRIFT FÜR GEOPHYSIK. A series of papers dealing with the propagation of sound in air appear in the above publication, Jahr. 10, Heft 3-4, Braunschweig, 1934. Abstracts of these by W. Ayvazoglou appear in *Geoph. Abs.*, No. 64, Aug., 1934. The list of authors, titles, and pagination may be given as follows:

DUCKERT, P., "Ergebnisse der Hörbeobachtungen des Sprengversuchs in Oldebroek am 15 Dezember 1932," pp. 119-126, and "Die Wetterlage und der Schichtung der Atmosphäre am 15 Dezember 1932, dem Sprengtag von Oldebroek," p. 127-144.

EDITORIAL, "Materialzusammenstellung der Schallregistrierungen während der Sprengungen in Oldebroek (Holland) am 15 Dezember 1932," pp. 145-158.

MEISSER, O. and MARTIN, H., "Beiträge zu den Luftschallmessungen," pp. 158-166.

REGULA, Herbert, "Schallausbreitung in der Atmosphäre," pp. 167-185.

JUNG, Heinrich, "Berechnung der Laufzeitkurven des anormalen Schalles für Windstille Atmosphäre und Vergleich mit der Laufzeitkurve der Oldebroek-Sprengung vom 15 Dezember 1932," pp. 186-196.

DUCKERT, P., "Ergebnisse der Registrierungen von Schallwellen an Kreisförmig um der Sprengherd angeordneten Stationen," pp. 197-200.

SANDMANN, B., "Beobachtungsergebnisse über den einfluss der 'akustischen Umkehrschicht' auf die Schallausbreitung," pp. 200-215.

KÖLZER, Joseph, "Zur Frage der anormalen Schallausbreitung," pp. 215-221.

WÖLCKEN, K., "Schalluntersuchungen im Polargebiet," pp. 222-234.

F.W.L.



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

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## SUBJECT INDEX FOR THE YEAR 1934

The following subject index for the items listed in the *Bibliography of Seismology* for the year 1934 has been prepared in the same form as that for the items listed in 1933 (see pages 357-359, Vol. X, No. 20, of these *Publications*) and may be considered a continuation of that index.

- A1. Aids to Seismological Study: Nos. 2043, 2076, 2102 (2), 2146, 2148, 2150, 2155, 2324, 2365, 2409, 2417, 2423, 2426, 2470, 2471, 2496.  
See also M1. (Maps).
- A2. Air; Sound Vibrations in: Nos. 2137, 2154, 2498, 2506.
- B1. Building Construction: Nos. 2083, 2128, 2145, 2148, 2149, 2161, 2166, 2167, 2172, 2178, 2179, 2195, 2196, 2205, 2223 (8), 2251, 2305, 2331 (1), 2346, 2368, 2392, 2401, 2436, 2455, 2472.
- B2. Bibliographies: Nos. 2071, 2076, 2095, 2132, 2150, 2191, 2301, 2366, 2413, 2428.
- B3. Biographies: Nos. 2095, 2107, 2249.
- B4. Biology, as Related to Seismology: No. 2224.
- C1. Catalogues of Earthquakes, Lists of Aftershocks, etc.: Nos. 2029, 2090, 2102, 2104, 2121, 2142, 2152, 2172, 2174, 2209, 2385, 2425, 2464 (4).  
See also R2. (Reports).
- C2. Causes of Earthquakes: Nos. 2010, 2022, 2057, 2068, 2073, 2215, 2330 (2), 2352, 2427, 2467, 2477.  
See also R3. (Rotation Variation).
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The present issue contains an illustrated article by N. H. Heck, entitled "On the Earthquake Strong-motion Program," followed by a short note by Frank Neumann on "Analyzing the Records." A new seismograph station is reported at State College, Pennsylvania, under the direct charge of Dr. H. Landsberg. The remaining items of news are grouped under the headings: Report of the Lisbon Meeting, Earthquake swarm, Magazine articles, Personalalia, Radio talk, Meeting of the Seismological Society of America (April 13-14, '34), Seismology at the A.A.A.S. Meeting (Dec. 31-Jan. 1, 34-5), Epicentres.

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

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

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

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

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

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

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

#### 2545. JAPANESE JOURNAL OF ASTRONOMY AND GEOPHYSICS.

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

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

- (2) IWANISI, Tadakazu, "Land Creep in Kii Province," *Ibid.*, 632-640.
- (3) ISHIMOTO, Mishio, "Causes of Earthquakes as Considered by Japanese in Old Times," Vol. 3, 39-44.
- (4) MUSYA, Kinkiti, "Some Phenomena that Preceded the Yedo Earthquake of 1855," *Ibid.*, 89-97.
- (5) KODAIRA, Takao, "The Strong Earthquake that Occurred in the Northern Part of Hirosima Prefecture in 1930," *Ibid.*, 155-166.
- (6) IWANISI, Tadakazu, "Earthquakes in Kii Province," *Ibid.*, 257-270.
- (7) NISINA, Nobuhiko and KOSIKAWA, Yosiaki, "Earthquake and Latitude Variation," *Ibid.*, 379-394.
- (8) FUKUTOMI, Takaharu and KAWASE, Ziro, "Tide and Earthquake or Volcanic Eruption," *Ibid.*, 484-498.
- (9) HAENO, Seizo, "Estimation of the Thickness of a Gravel Layer Underlying a River," *Ibid.*, 660-684.
- (10) SUZUKI, Takeo, "Acceleration of Earthquake Motions Calculated from Seismograms," *Ibid.*, 719-735.
- (11) NASU, Nobuji, "The Strong Earthquake on September 21, 1931, in Saitama Prefecture," *Ibid.*, 745-754.

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

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

2547. JOST, W., "Eistiefenmessungen am Rhonegletscher im Juli und August, 1931," *Verhand. Schweiz. Natur. Gesell., Sec. Geoph. Meteor. Ast.*, Jahr. 114, 341-342, Altdorf, 1933.

F.W.L.

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

K.J.

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

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

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

K.J.

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

— KANAI, Kiyoshi and SEZAWA, Katsutada,

- (1) "Amplitudes of Dispersive Rayleigh-waves at Different Depths of a Body."
- (2) "Some New Problems of Free Vibrations of a Structure."
- (3) "Some New Problems of Forced Vibrations of a Structure."

See No. 2586 of this list.



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

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

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

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

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

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

The author's abstract reads:

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

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

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

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

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

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

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

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

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

2556. LAMBERT, Walter D.,

- (1) "Note on the Reduction of Gravity Observations to Sea Level for the Purpose of Determining the Geoid," *Bul. Geod., I.U.G.G., No. 41, 26-33, Jan., Feb., Mar., 1934.*
- (2) Review of "Physikalische Geodäsie," by F. HOPFNER, *Mathematik in Monographien und Lehrbüchern, No. 15, Leipzig, Akademische Verlagsgesellschaft, 1933, ix + 434 pp. Bul. Amer. Math. Soc., 644-645, Sept., 1934.*
- (3) Review of "Traité de Géodésie," by P. TARDI, Gauthier-Villars, 1934, xxx + 732 pp. Price 150 francs. *Ibid., 783-785, Nov., 1934.* W.D.L.

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

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

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

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

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

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

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

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

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

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

2562. MARTIN, H.,

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

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

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

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

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

2564. MEISSER, O.,

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

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

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

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

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

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

- MOORE, P. D. and LINK, Theodore A., "Structure of Turner Valley Gas and Oil Field, Alberta." See No. 2559 of this list.
- MORRIS, Samuel B. and PEARCE, Cecil E., "A Concrete Gravity Dam for a Faulted Mountainous Area." See No. 2578 of this list.
- MUSYA, Kinkiti, "Some Phenomena that Preceded the Yedo Earthquake of 1855." See No. 2545 of this list.
2566. NARYSKINA, E. (C. NARYCHKINA), "Sur les vibrations d'un demi-espace aux conditions initiales arbitraires," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 45, 71 pp., 7 fig., Leningrad, 1934. N.V.R.
- NASU, Nobuji, "The Strong Earthquake on September 21, 1931, in Saitama Prefecture." See No. 2545 of this list.
2567. NATURE. The following short notes of interest to seismologists have appeared recently in Vol. 134 of the above publication:
- (1) "Seismometric Reports on Tokyo Earthquakes," No. 3383, p. 329, London, Sept. 1, 1934. F.D.H.
  - (2) "Earthquakes of December 15," No. 3399, p. 963, Dec. 22, 1934.
  - (3) "Submarine Terraces around Japan," *Ibid.*, p. 976.
  - (4) "Pressure Waves from Explosions," *Ibid.*, 976-977.
2568. NATURE, "Sir Alfred Ewing, K.C.B., F.R.S.," *Nature*, No. 3404, Vol. 135, 137-140, London, Jan. 26, 1935.
- An obituary notice in three sections: the first by T. Hudson Beare, the second by R. T. Glazebrook, and the third by Edgar C. Smith. The second note deals particularly with the subject: *Sir Alfred Ewing and his Cambridge Chair*. The third is entitled: *Sir Alfred Ewing and Naval Education*.
2569. NAVARRO NEUMANN, M. Ma. S., S.J., "La sismología: ojeada retrospectiva, recientes progresos." Reprint from *Ibérica*, Nos. 1044-45-46-48-49, pp. 237-240, 255-256, 270-272, 300-304, 317-319, bib., Barcelona, Nov.-Dec., 1934. N.N.
- The article is a brief review of the state and progress of seismology since the beginning of the present century. The author discusses the contributions of the various countries and expresses his criticisms. He is particularly well qualified to write a paper of this nature as he was for more than a quarter of a century the Director of the station at Cartuja, Spain, now passed into other hands. He has also had practical experience in the construction of seismographs. E.A.H.
2570. NEUMANN, Frank, "Analysis of Strong Motion Seismograph Records of the Western Nevada Earthquake of January 30, 1934, with Description of a Method of Analyzing Seismograms by Precise Integration," *U.S.C.G.S. Pub.*, Strong Motion Report No. 4, 22 pp., Washington, Sept., 1934.



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

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

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

2572. NOVOTORZEV, V. I.,

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

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

Both the above papers are in the Russian language.

N.V.R.

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

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

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

F.W.L.

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

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

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

The present volume deals, in order, with:

(1) Introduction.

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

- (3) The Seismic Activity in Japan in the Year 1933.
- (4) Conspicuous Distant Earthquakes Observed in Japan in the Year 1933.
- (5) Volcanic Activity in the Year 1933.
- (6) List of the Meteorological Stations Equipped with Sensitive Seismographs.

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

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

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

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

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

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

2579. PROVIERO, A., "Il dissincronismo in sismometria alle prove della piattaforma oscillante (per il case di  $T > T_0$ )," *Bol. Soc. Sis. Ital.*, Vol. 32, Fasc. 5-6, 7 pp., 10 fig., Rome, 1934. A.P.

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

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

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

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

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

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

## 2584. SCIENCE NEWS-LETTER.

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

- (1) "Amazing Landscape Lies Beneath the Pacific Ocean," (by F. P. Shepard), No. 710, p. 310, Washington, Nov. 17, 1934.
- (2) "Time Signals Now Broadcast Twenty Times Each Day," *Ibid.*, p. 311.
- (3) "Earthquake Shakes Bering Sea Bottom," *Ibid.*, p. 313.
- (4) "Earth Sent Own Messages on Recent Earthquakes," *Ibid.*, No. 714, p. 376, Dec. 15, 1934.
- (5) "Shifting Water of Ocean Tides Tilts Earth's Crust," *Ibid.*, No. 715, p. 392, Dec. 22, 1934.

Other notes appearing in Vol. 27 are:

- (6) "Earthquake Waves Focus Near Earth's Opposite Side," No. 717, p. 8, Jan. 5, 1935.
- (7) "Seismic Soundings Reveal Antarctic Ice Thickness," No. 718, p. 24, Jan. 12, 1935.
- (8) "Three Earthquakes Usher in the New Year," *Ibid.*, p. 24.
- (9) "Grand Canyon Region Shaken by Local Quake," No. 720, p. 27, Jan. 26, 1935.

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

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

J.H.S.

## 2586. SEZAWA, Katsutada and KANAI, Kiyoshi,

- (1) "Amplitudes of Dispersive Rayleigh-waves at Different Depths of a Body," *Bul. Eq. Res. Inst.*, Vol. 12, Part 4, 641-649, 8 fig., bib., Tokyo, Dec., 1934.
- (2) "Some New Problems of Free Vibrations of a Structure," *Ibid.*, 804-822, 14 fig.
- (3) "Some New Problems of Forced Vibrations of a Structure," *Ibid.*, 823-853, 12 fig.

2587. SHEPARD, F. P., "Detailed Surveys of Submarine Canyons," *Science*, No. 2079, Vol. 80, 410-411, 1 fig., New York, Nov. 2, 1934. See also No. 2584 (1) of this list.2588. SHEPARD, F. P., TREFETHEN, J. M., and COHEE, G. V., "Origin of Georges Bank," *Bul. Geol. Soc. Amer.*, Vol. 45, No. 2, 281-302, 7 fig., Washington, Apr. 30, 1934.

## 2589. SIEBERG, A.,

- (1) "Ein Beitrag zur Frage der Wirtschaftsgefährdung durch Erdbeben in Deutschland," *Veröff. Jena*, Heft 23, 1-10, 1 map, Leipzig, 1934.
- (2) "Tätigkeitsbericht der Reichsanstalt für Erdbebenforschung für die Zeit vom 1. April 1933 bis zum 31 März 1934," *Ibid.*, Heft 24, 1-15, bib., Leipzig, 1934. A.S.

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

2590. SOBOLEFF, S.,

- (1) "Théorie de la diffraction des ondes planes," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 41, 23 pp., 8 fig., 3 tab., 1 pl., Leningrad, 1934.
- (2) "Sur l'intégration de l'équation d'ondes pour un milieu hétérogène," *Ibid.*, No. 42, 26 pp., Leningrad, 1934.

Both of the above papers are in Russian.

N.V.R.

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

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

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

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

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

"The first sound arriving at the near surface hydrophone from near surface bombs had been reflected from the bottom once for travel-times ranging from 11.6 to 28.2 seconds; for travel-times ranging from 28.3 to about 40 seconds the first arriving sound had been reflected twice from the bottom.

"The first sound arriving at the hydrophone at 300 fathoms depth from near surface bombs for travel-times ranging from 11.6 to 26.1 seconds had gone directly to the hydrophone after one reflection from the bottom. For a travel-time of 27.2 seconds the first unmistakable arrival had been reflected once from the bottom, then from the surface, before reaching the hydrophone.

"The first sound arriving at the hydrophone at 850 fathoms depth from near surface bombs for a travel-time of 17.2 seconds had gone directly to the hydrophone after one reflection from the bottom. For travel-times ranging from 18 to 28 seconds the first arriving sound had been reflected once from the bottom and then from the surface before reaching the hydrophone.

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

"The average horizontal (apparent) velocity for travel-times of from 34.5 to 39.5 seconds is about 1484.5 m/s under the conditions of the experiment. The error is probably less than 5 m/s."

J.H.H. + L.D.L.

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

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



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E.A.H.

## LIST OF COLLABORATORS

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

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The present issue gives notice of the forthcoming Tenth Annual Meeting of the Eastern Section, to be held in Ottawa, Canada, on May 27-28, 1935.

The further contents of the issue are as follows: The Nebraska Earthquake of March 1, 1935; Macelwane Lectures; Earthquakes Recorded at Harvard Seismograph Station; Seismic Prospecting Equipment and Bridge Foundations; Seismological Program in California; Resolutions of Interest Passed at the Fifth Pacific Science Congress, June 14, 1933; New Books Soon to Appear (*Theoretical Seismology—Part I*, by James B. Macelwane, S.J.); Bihar Earthquake of 1934; Earthquakes in Region of the Grand Canyon of the Colorado; The Baluchistan Earthquake, August 25 and 27, 1931 (by N. H. Heck); Location of Epicentres by Science Service, U.S. Coast and Geodetic Survey, and the Jesuit Seismological Association.

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The papers of particular interest to seismologists are to be found in Vol. 2 and Vol. 3. They are indicated below by names of authors. The titles and pagination will be found reported in this issue of the *Bibliography* in the alphabetical positions determined by the names of the respective authors.

Vol. 2. First Divisional Symposium—Physical Sciences: Papers by Meinesz, Ogura, Krempf and Chevy, McManus and Collins, van Riel, Soule, Forbush, and Marshall. Second Divisional Symposium—Physical Sciences: Paper by Andrews. First Divisional Symposium—Biological Sciences: Paper by Hatai. Section on Astronomy—Fifth Session: Paper by Sotome. Section on Geodesy and Geography—First Session: Papers by Meinesz, Sanchez, Bowie, and Miller and Hughson. Section on Geodesy and Geography—Third Session: Papers by Rude, Bowie, King and Jobberns, and Gutenberg.

Vol. 3. Section on Seismology and Volcanology. Third Session. Papers by Fujiwhara, Takahasi, Imamura, Ishimoto, Muto, and Tsuboi and Miyabe. Fourth Session: Papers by Kunitomo, Visser, Wood, Heck, and Macelwane. Fifth Session: Papers by Heck, Benioff, Hodge, Gherzi, McComb, and Wenner. Sixth Session: Papers by Ishimoto, Daly, Gutenberg, Jeffreys, Repetti, and Macelwane. Discussion: pp. 2547-2549.

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W.H.

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- (1) "Slow Crustal Movements in the Earthquake Region as Revealed by Clinographic Observation," Vol. 3, 2329-2331, bib., *P.F.P.S.C.*, reported as No. 2623 of this list.
- (2) "On Some Seismological Instruments with Special Reference to the Acceleration Seismograph," *Ibid.*, 2499-2502, bib.

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"The times of  $S$ ,  $SKS$ ,  $SKKS$ , and  $S_0S$  are subject to an additive constant  $Z$  special to each earthquake and attributable to variation of focal depth within the upper layers. Its range of variation is at least 12 seconds, and possibly 17 seconds. Other additive constants, whose amounts are still unknown, are applicable to  $P_0S$ ,  $PKS$ ,  $PKKS$  and their analogues, and to all surface reflections." H.J.

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— KANAI, Kiyoshi, NISHIMURA, Genrokuro, and TAKAYAMA, Takeo, "On the Long Waves in a Bay of Variable Section Generated by Changes in the Elevation of the Mouth of It." See No. 2684 of this list.

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- (1) "Discontinuity in Dispersion Curves of Rayleigh-Waves."
- (2) "Periods and Amplitudes of Oscillations in  $L$ - and  $M$ -phases."

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2657. KAWABATA, Yukio, "Approximate Determination of the Spheroid most nearly Representing the Surface of Japan," *Bul. Eq. Res. Inst.*, Vol. 13, Part 1, 54-79, 3 fig., 5 tab., Tokyo, Mar., 1935.
- KIMURA, Hayabusa and INOUE, Win, "Experiments on Artificial Earthquakes." See No. 2651 of this list.
- KING, L. C. and JOBBERNS, G., "Shore-line Changes on the New Zealand Coast," Vol. 2, 1285-1295, 1 fig., bib., *P.F.P.S.C.*, reported as No. 2623 of this list.
2658. KIRNOS, D. P., KORIDALIN, E. A., MASARSKIJ, S. I., and RAĪKO, N. V., "Arbeiten des Seismologischen Instituts der Akademie der Wissenschaften der USSR auf dem Gebiet des seismischen Prospektion," *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 47, 1-70, 33 fig., Leningrad, 1934. N.V.R.
- The paper is in the Russian language.
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- KREMPF, A. and CHEVEY, P., "The Continental Shelf of French Indo-China and the Relationship Which Formerly Existed Between Indo-China and the East Indies," Vol. 2, 849-852, 1 fig., 1 tab., *P.F.P.S.C.*, reported as No. 2623 of this list.
- KROMER, Clarence H., "Administration of California's Safety of Construction of Public Schools Act." See No. 2704 of this list.
2661. KRUMBACH, Gerhard,
- (1) "Über die Aufzeichnung von Fernbeben mit kurzperiodischen Seismometern," *Veröff. Jena*, Heft 23, 11-16, 3 fig., 2 tab., Leipzig, 1934.
  - (2) "Seismische Registrierungen in Jena, 1. Januar bis 31. Dezember 1934," *Ibid.*, Heft 25, 25 pp., 1935.
- KUENEN, Ph. H., MEINESZ, F. A. Vening, and UMBGROVE, J. H. F., "Gravity Expeditions at Sea, 1923-1932, Vol. II." See No. 2672 of this list.
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(2) "The Structure of the Outer Crust of the Earth in the Pacific Ocean Region," *Ibid.*, 2533-2538, bib.

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- (1) "Über Schattenwellen und Kernwellen," *Bul. Eq. Res. Inst.*, Vol. 13, Part 1, 39-45, Tokyo, Mar., 1935.
- (2) "Seismometrische Untersuchungen des Erdbebens vom 2. März 1933," *Ibid.*, 171-193, 9 fig., 4 tab.

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## — McILWRAITH, C. G., DYK, Karl, and SWAINSON, O. W., "Velocity and Ray Paths of Sound Waves in Deep Sea Water." See No. 2704 of this list.

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- (1) "Recent Soundings in the Pacific," Vol. 2, 837-838, 1 tab., *P.F.P.S.C.*, reported as No. 2623 of this list.
- (2) "Results of Gravity Survey on the Pacific Ocean since Fourth Congress," *Ibid.*, 1151-1157, 1 map.

2672. MEINESZ, F. A. Vening, UMBGROVE, J. H. F., and KUENEN, Ph. H., "Gravity Expeditions at Sea, 1923-1932: Vol. II, Report of the Gravity Expedition in the Atlantic of 1932 and the Interpretation of the Results." Pub. Netherlands Geodetic Commission (*Uitgegeven door de Rijkscommissie voor Graadmeting en Waterpassing*), pp. 1-208, 5 pl., separate set of tables, Delft, 1934.

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## — MEISSER, O. and SCHMÜCKING, H., "Der Einfluss des Antriebs auf die Schwingungsdauer eines Pendels." See No. 2701 of this list.

2674. MENEFEE, F. N., "Use of Telemeter in Finding Force of, and Stresses due to, Instantaneous Loads," *Jour. Frank. Inst.*, Vol. 219, No. 2, 167-185, 6 fig., 4 tab., Philadelphia, Feb., 1935.

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2675. MINAKAMI, Takeshi, "Distribution des mouvements initiaux d'un séisme dont le foyer se trouve dans la couche superficielle et détermination de l'épaisseur de cette couche," *Bul. Eq. Res. Inst.*, Vol. 13, Part 1, 114-129, 22 fig., 4 tab., Tokyo, Mar., 1935.
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- (1) "An Arcuate Form of Thread and Its Geophysical Analogy," *Proc. Imp. Acad.*, Vol. 10, No. 9, 561-563, 5 fig., Tokyo, Nov., 1934.
  - (2) "A Study of Landslides," *Bul. Eq. Res. Inst.*, Vol. 13, Part 1, 85-113, 29 fig., Tokyo, Mar., 1935.
  - (3) "A Statistical Study of the Itô Earthquake Swarms," *Ibid.*, 155-170, 4 fig., 7 tab.
- MIYABE, Naomi and TERADA, Torahiko, "Results of Revision of Precise Levelling in Tohoku Districts." See No. 2714 of this list.
- MIYABE, N. and TSUBOI, C., "On the Modes of Crust Deformation as Detected by Means of Precise Geodetic Surveys," Vol. 3, 2337-2339, *P.F.P.S.C.*, reported as No. 2623 of this list.
- MOORE, William W. and McLEAN, Ralph S., "Computations of Periods of Elevated Water Tanks." See No. 2704 of this list.
- MUTO, K., "Earth Movements in the Mino-Owari District Since the Great Earthquake of 1891," Vol. 3, 2333-2335, 1 fig., 1 tab., *P.F.P.S.C.*, reported as No. 2623 of this list.
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2679. NARYSKINA, E., "Sur les ondes de Rayleigh dans l'espace à trois dimensions," *Bul. Acad. Sc. URSS.*, No. 48, 32 pp., Leningrad, 1934. N.V.R.
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2680. NATURE. In addition to those previously listed, the following notes of interest to seismologists have appeared in *Nature*, Vol. 133, London, Jan.-June, 1934:
- (1) "Indian Earthquake of January 15," No. 3352, p. 131, Jan. 27.
  - (2) "Indian Earthquake of January 15," No. 3353, 168-169, Feb. 3.
  - (3) "Destructive Earthquakes in 1933," No. 3354, p. 207, Feb. 10.
  - (4) "Initial Motion of Earthquakes," No. 3358, p. 385, Mar. 10.
  - (5) "North American Earthquakes," No. 3359, 411-412, Mar. 17.
  - (6) "Mexican Earthquake of January 14, 1931," No. 3360, p. 466, Mar. 24.
  - (7) "Kew Observatory Records Earthquake of May 4," No. 3367, p. 720, May 12.
  - (8) "The Indian Earthquake of January 15, 1934" and "After-shocks of the Bihar Earthquake," No. 3371, p. 863, June 9.
  - (9) "Earthquakes in Bulgaria," No. 3374, p. 989, June 30.

2681. NATURE. In addition to those previously listed, the following notes of interest to seismologists have appeared in *Nature*, Vol. 134, London, July-Dec., 1934:

- (1) "The Noto (Japan) Earthquake of 1933," No. 3375, 31-32, July 7.
- (2) "Panama Earthquake of July 18," No. 3378, p. 135, July 28.
- (3) "Re-surveys in Earthquake Areas," No. 3378, p. 146, July 28.
- (4) "The Central Core of the Earth," No. 3381, p. 257, Aug. 18.
- (5) "Earthquake in Scotland," No. 3382, p. 282, Aug. 25.
- (6) "Seismometric Reports on Tokyo Earthquakes," No. 3383, p. 329, Sept. 1.
- (7) "Dynamics of Earthquake Resistant Structures," No. 3387, p. 479, Sept. 29.
- (8) "The South Atlantic Earthquake of June 27, 1929," No. 3387, p. 501, Sept. 29.
- (9) "Speculative Borings in the Earth's Crust," No. 3388, p. 529, Oct. 6.
- (10) "Dhubri Earthquake of July 3, 1930," No. 3389, p. 576, Oct. 13.
- (11) "Periodicity of Earthquakes," No. 3390, p. 631, Oct. 20.
- (12) "The Hourly Frequency of Italian Earthquakes," No. 3392, p. 711, Nov. 3.
- (13) "The Texas Earthquake of Aug. 16, 1931," No. 3393, 741-742, Nov. 10.
- (14) "The Internal Heat of the Earth," No. 3393, p. 746, Nov. 10.
- (15) "Earth-sounds in the East Indies," No. 3394, p. 769, Nov. 17.

2682. NATURE, "Sir Horace Lamb, F.R.S.," *Nature*, No. 3407, Vol. 135, 255-257, London, Feb. 16, 1935.

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- (1) "La repartition des epicentres sismiques calamiteux en Italie," *Bul. Soc. Belge d'Astron.*, Nos. 1-2, 2 pp., Jan.-Feb., 1935.
- (2) "Le R. P. Bonaventure Berloty, S.J.," *Revue des Questions Scientifiques*, Mar. 20, 1935.
- (3) "Notas sismicas de 1933," *Ibérica*, No. 1062, 8 pp., 8 illus., Barcelona, Mar. 9, 1933. N.N.

2684. NISHIMURA, Genrokuro, TAKAYAMA, Takeo, and KANAI, Kiyoshi, "On the Long Waves in a Bay of Variable Section Generated by Changes in the Elevation at the Mouth of It" (in Japanese with short abstract in English), *Bul. Eq. Res. Inst.*, Vol. 13, Part 1, 46-53, 3 fig., Tokyo, Mar., 1935.

2685. NÖRLUND, N. E. and BROCKAMP, B., "Seismische Feldarbeiten in Dänemark, durchgeführt vom Geodätischen Institut in den Jahren 1932-1933," *Institut Géodésique de Danemark, Mémoires*, Third Series, Tome 2, 48 pages, many maps, tables, etc., Copenhagen, 1934.

2686. OAKSHOTT, S. J., "The Indian Earthquake," *Quar. J. R. Met. Soc.*, No. 254, Vol. 60, 185-186, London, Apr., 1934.

2687. OBSERVATORY. In No. 730, Vol. 58, Mar., 1935 issue of the above publication appear two items of interest to seismologists, namely:

- (1) "Geophysical Discussion," pp. 71-76.
- (2) "A World-wide Survey of Microseismic Disturbances," p. 93.

The first of the above is the report of a discussion at the meeting of the Geological Society of London, held on Jan. 23, and dealing with the subject of "The Hypothesis of Continental Drift." The second is a review signed R.S. and discussing the recent paper by A. W. Lee on the subject indicated. The paper was reported as No. 2557 of these lists.

- OGURA, S., "On Recent Soundings and Mapping of the Sea Floors in the Seas near Japan," Vol. 2, 839-847, 2 fig., bib., *P.F.P.S.C.*, reported as No. 2623 of this list.
2688. OLTAY, Karl, "Radó v. Kövesligethy," *Ger. Bei.*, Bd. 43, Heft 4, 337-339, Leipzig, 1935.  
An obituary on Prof. Kövesligethy who died Oct. 11, 1934.
2689. OXFORD UNIVERSITY, "The International Seismological Summary, 1930, July, August, September," 199-310, Oxford, 1934.
2690. PASTOR, A. Rey, "Datos sísmicos de la península Ibérica, 3<sup>er</sup> trimestre de 1934," *Ibérica*, No. 1048, 2 pp., 1 map, Barcelona, Dec., 1934. A.R.P.
2691. PAYMAN, W., WOODHEAD, D. W., and TITMAN, H., "Explosion Waves and Shock Waves. Part II: The Shock Wave and Explosion Products sent out by Blasting Detonators," *Proc. Roy. Soc.*, Series A, No. 865, Vol. 148, 604-622, 30 fig., London, 1935.
2692. PIRSON, Sylvain J., "La prospection du pétrole par la méthode des réflexions des ondes séismiques," *La Revue Pétrolifère*, No. 605, 1402-1405, Paris, 1934.  
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2693. PREY, A., "Über die Elastizitätskonstante der Erde, II Mitteilung," *Ger. Bei.*, Bd. 44, Heft 1, 59-80, Leipzig, 1935.
- PYE, F. W. and WOONTON, G. A., "Note on an Optical System for Shadow Recording with Oscillographs." See No. 2726 of this list.
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- (2) "Elastic Rock Layers Found 35 Miles Down in the Earth," No. 731, p. 233, Apr. 13, 1935.
- (3) "Formosa's Tragic Earthquake Recorded by Seismographs," No. 733, p. 269, Apr. 27, 1935.

2704. SEISMOLOGICAL SOCIETY OF AMERICA. The Thirty-fourth Annual Meeting of the Cordilleran Section of the Geological Society of America was held at Stanford University, April 12-13, 1935, together with the meetings of the Paleontological Society of the Pacific Coast, the Seismological Society of America, and the Le Conte Club. A program of the meetings was published by the Geological Society of America. Abstracts of the papers in the section devoted to the Seismological Society of America are as follows:

- "Velocity and Ray Paths of Sound Waves in Deep Sea Water," O. W. Swainson, C. G. McIlwraith, and Karl Dyk.
- "Earthquake Catalogs," S. D. Townley.
- "Instrumental Method for the Determination of the Extent of Faulting," Hugo Benioff.
- "Observed  $P$  at about 20 Degrees and the Question of Subcrustal Discontinuities," B. Gutenberg and C. F. Richter.
- "Effect of Crustal Structure on the Reflection of  $PP$ ," B. Gutenberg and C. F. Richter.
- "Northern California Earthquakes of May 16, 1933, and June 7, 1934," Perry Byerly and James T. Wilson.
- "Lunar Control of Time of Shock on San Jacinto, Agua Caliente, and Elsinore Faults of Southern California, during 1934," Maxwell W. Allen.
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- (b) "Karte der Wirtschaftsgefährdung durch Erdbeben im Rheinischen Industriegebiet," 11 pp., 1 coloured pl.
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2748. CARLI, F. D., "Il terremoto di 'Sampacho' nell'Argentina," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 1-2, 50-56, 5 fig., Rome, 1935.

The article is followed by a one-page note by G. Agamennone. G.A.

2749. CHERMANN, D., "Sur une méthode de la solution du problème statique de l'élasticité pour les domaines multiplement connexes" (in Russian with long *résumé* in French), *Pub. Inst. Seis., Acad. Sc. URSS.*, No. 54, 27 pp., Leningrad, 1935. N.V.R.

2750. CLARK, Robert P., "Reflection Shooting by Geophysicist on Progress of His Art," *Oil and Gas Jour.*, Vol. 33, No. 46, 129-131, Tulsa, 1935. F.W.L.

- COMBS, Theodore C., GREEN, Norman B., and HORNER, A. C., "Tests Indicate Design Methods for Earthquake-proof Timber Floors." See No. 2763 of this list.

2751. CRESKOFF, Jacob J., "Dynamical Design of Aseismic Structures," *Bul. S.S.A.*, Vol. 25, No. 2, 180-183, Stanford, Apr., 1935.

2752. CRESKOFF, Jacob J.,

- (1) "Periods of Vibration of Buildings: An Index to Their End Conditions," *Jour. Frank. Inst.*, Vol. 219, No. 5, p. 573, Lancaster, May, 1935.

The paper indicates that the ratio of fundamental to first harmonic periods about an axis reveals the fixity of the building about that axis. R.R.B.

- (2) "Period of Vibration as an Index to Structural Integrity," *Engineering*, No. 3622, Vol. 139, p. 168, London, June 14, 1935.

Change in period of vibration of a building after an earthquake is considered to indicate a change in its elastic resistance. R.R.B.



— DAHM, C. G. and BRADFORD, Donald C., "The Rodney, Missouri, Earthquake of August 20, 1934." See No. 2741 of this list.

2753. DAVISON, Charles, "Periodic Variations in the Mean Focal Depth of Japanese Earthquakes," *Nature*, No. 3402, Vol. 135, 76-77, London, Jan. 12, 1935.

2754. DINCA-SAMURACAS, Alexandre, "La polarisation des ondes séismiques dans la phase primaire des tremblements de terre," *C.R.*, T. 200, No. 21, 1772-1773, 1 fig., Paris, May 20, 1935.

2755. DOBBERSTEIN, H., "Eichung von Schallempfängern (Undographen und membran Apparate)," *Zeit. Geoph.*, Bd. 11, Heft 1-2, 102-106, Braunschweig, 1935. F.W.L.

2756. DYK, Karl, "On the Reduction of Seismograms Obtained in Shaking-table Experiments," *Bul. S.S.A.*, Vol. 25, No. 2, 119-137, 10 fig., 1 tab., Stanford, Apr., 1935.

2757. EDGE, A. B. Broughton, "Prediction of Earthquakes," *Nature*, No. 3424, Vol. 135, p. 997, London, June 15, 1935.

The author suggests that electrokinetic phenomena be examined in seismic areas in order to determine whether changes in these might indicate the coming of an earthquake and perhaps its epicentre.

2758. ENGINEERING NEWS-RECORD,

(1) "Indian Earthquake Destroys Large Cities and Takes Heavy Toll of Lives," *Eng. N.-R.*, Vol. 114, No. 23, p. 823, New York, June 6, 1935.

(2) "Opportunity to Learn," *Ibid.*, Vol. 115, No. 3, p. 96, New York, July 18, 1935.

A brief note pointing out the opportunity offered by the occurrence of several slight earthquakes in California to study the effects on the two bridges now under construction near San Francisco.

2759. FORD, C. Reginald, "Earthquake Resisting Design." Worthington Press, 23 pp., bib., Auckland, 1935.

A pamphlet reporting a paper read at the annual meeting of the New Zealand Institute of Architects, Wellington, February 25, 1935.

2760. FUKUTOMI, Takaharu, "On Crustal Deformations in Southern Idu Peninsula," *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 3, 279-291, 11 fig., Tokyo, 1935.

— GIANELIA, Vincent P. and CALLAGHAN, Eugene, "The Earthquake of January 30, 1934, at Excelsior Mountains, Nevada." See No. 2746 of this list.

2761. GOULD, Ralph E., "Standard Time Throughout the World," *Cir. Nat. Bur. Stand.*, No. C 406, 24 pp., 3 fig., 5 tab., bib., Washington, 1935.

This paper may be obtained from the Superintendent of Documents, Washington, D.C., U.S.A., at the nominal price of five cents. It is a useful reference paper for seismologists.

2762. GRAF, A., "Seismic Prospecting," *Archiv für technische Messungen*, Vol. 4, 143-144, Nov., 1934. F.W.L.
2763. GREEN, Norman B., HORNER, A. C., and COMBS, Theodore C., "Tests Indicate Design Methods for Earthquake-proof Timber Floors," *Eng., N.-R.*, Vol. 114, No. 25, 871-875, 4 fig., 4 tab., New York, June 20, 1935.
- GRUNDY, E. and HOLMES, W., "Small Self-starting Synchronous Time Motors." See No. 2773 of this list.
2764. GUTENBERG, B. Review of "A World-wide Survey of Microseismic Disturbances Recorded during January, 1930," by A. W. Lee (Item 2557 of these lists), *Bul. S.S.A.*, Vol. 25, No. 2, 190-191, Stanford, Apr., 1935.
2765. HANSEN, W. H., "Kleinst- synchronmotoren," *Feinmech.*, Jahr. 43, No. 6, 89-92, 11 fig., Berlin, July, 1935.
2766. HARTREE, D. R., "The Differential Analyser (at the University of Manchester)," *Nature*, No. 3423, Vol. 135, 940-943, 2 fig., bib., London, June 8, 1935.
2767. HAYES, R. C.,
- (1) "The Sounds Produced by the Buller Earthquake of 17th June, 1929." Reprint 8 pp., printed by the New Zealand Astronomical Society, with map and bibliography, Wellington, 1935.
  - (2) "The Focal Depth of the Pacific Earthquake of September 6th, 1933," *Dom. Obs. (N.Z.) Bul.*, No. 94, 2 pp., 2 fig., Wellington, 1935. C.E.A.
- HAYES, R. C. and BASTINGS, L., "Earthquake Distribution in New Zealand, 1848-1934." See No. 2737 of this list.
2768. HEDLEY, Elias, "Improvements in or Relating to Apparatus for Acoustically Determining Depths and Other Distances," British Patent 421338, issued January 2, 1935.
- This invention relates to the apparatus for determining depths wherein a sound is reflected from the bed of the ocean or from an object the distance of which it is desired to determine, the time between the production of the sound and reception of the echo affording a measure of the depth or distance as the case may be.
- The Submarine Signal Co. (London) is a joint holder of the patent. F.W.L.
- HENDERSON, J. and ADAMS, C. E., "Seismology in New Zealand." See No. 2729 of this list.
- HERRMANN, H., UDLUFT, H., and STOCKE, K., "Gebirgsdruck und Plattenstatik." See No. 2830 of this list.
2769. HEYBROCK, Werner, "Earthquakes as a Cause of Glacier Avalanches in the Caucasus," *Geog. Rev.*, Vol. 25, No. 3, 423-429, 4 fig., bib., New York, July, 1935.
2770. HILLER, W., "Die Erdbebentätigkeit im Gebiete der Schwäbischen Alb (I Mitteilung auf Grund der Beben in den Jahren 1928 bis 1934)," *Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg*, Jahr. 90, 1-19, 12 fig., Stuttgart, 1934.

I. Chronology of the Alps earthquakes 1928-1934. II. Earthquake foci and tectonics of the Swabian Alps. III. Depth of foci and precedence in the Alps earthquakes; structure of the earth's crust in the region of the northern Alps. W.H.

2771. HILLER, W.,

- (1) "Erdbebenherde und Tektonik im Gebiete der Schwäbischen Alb," *Zeit. Geoph.*, Bd. 11, Heft 1-2, 15-19, Braunschweig, 1935.
- (2) "Eine einfache und sichere Art der Zeitmarkierung bei mechanisch-registrierenden Seismographen," *Ibid.*, 19-23.

2772. HILLER, W., "Seismische Berichte der Württembergischen Erdbebenwarten, Jahrgang 1934," *Veröffentlichungen der Meteorologisch-geophysikalische Abteilung des Württembergischen Statistischen Landesamts*, i-iii + 1-69 + A1-A14, Stuttgart, 1935.

Pages i-iii give a *résumé* of the seismological work of the Württemberg, Ravensburg, and Messstetten-Ebingen stations. Pages 1-69 present the seismological records for the year 1934. The A-pages (5 fig., bib.) discuss the details of particular near earthquakes. W.H.

2773. HOLMES, W. and GRUNDY, E., "Small Self-starting Synchronous Time Motors," *Horological Jour.*, No. 923, Vol. 77, 348 seq., London, July, 1935.

This article was begun in the May issue of the *Journal* and is not concluded in the July issue.

2774. HONDA, H. and MIURA, T., "On the Strain Produced in a Semi-infinite Elastic Solid by Statical Surface Force, with Some Applications to Seismology," *Geoph. Mag.*, Vol. 10, No. 1, 61-81, 7 fig., Tokyo, June, 1935.

In the concluding summary, the authors outline the mathematical problem treated as such and add: "It is suggested that some of the results of our calculations may be applied to elucidate the nature of the deformation of the earth's crust which was generated accompanying severe earthquakes such as the north Idu earthquake or the north Tango earthquake, lately occurring in this country."

— HORNER, A. C., COMBS, Theodore C., and GREEN, Norman B., "Tests Indicate Design Methods for Earthquake-proof Timber Floors." See No. 2763 of this list.

— HUSIMI, Kōji and TAKAHASHI, Koitiro, "Vibrating Systems Exposed to Irregular Forces." See No. 2834 of this list.

2775. IIDA, Kumizi, "Experiments on the Visco-elastic Properties of Pitch-like Materials (II)," *Bull. Eq. Res. Inst.*, Vol. 13, Part 2, 433-456, 26 fig., 5 tab., Tokyo, June, 1935.

2776. IMAMURA, Akitune, "Later Movements in the Northwest Osaka Block," *Proc. Imp. Acad.*, Vol. 11, No. 5, 186-188, 1 fig., Tokyo, May, 1935.

2777. IMAMURA, G., "On the Wave-length of the Earth-wave," *Geog. Rev.*, Vol. 9, Tokyo, 1935.

A review by K. Muto appears on page (22) of the abstracts section of the *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 3, Tokyo, 1935.

2778. ITOO, Tokunosuke, "Schwingungsproblem in einem nicht-homogenen elastischen Körper," *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 2, 173-217, Tokyo, 1935.

The paper is mathematical. It is divided into three parts, occupying respectively the sections 173-186, 187-196, 197-217.

2779. JEFFERS, Hamilton M., "The Shortt Clock of the Lick Observatory," *Lick Observatory Bulletin*, No. 468, 75-79, 4 fig., Berkeley, 1935.

The paper is an account of the experience of the Lick Observatory with a continuous run of a Shortt clock, from 1929 to 1935. Among other points of interest, is the description of the effect of local earthquakes and also distant earthquakes on the rate of the clock.

2780. JEFFREYS, Harold,

(1) "Time and Amplitude Relations in Seismology," *Proc. Phys. Soc.*, Vol. 47, 455-458, London, May 1, 1935.

The discussion of this paper appears on p. 459 of the same issue.

(2) "Constitution of the Earth," *Nature*, No. 3418, Vol. 135, 678-680, London, May 4, 1935.

(3) "The Surface Waves of Earthquakes," *M.N. Geoph. Sup.*, Vol. 3, No. 7, 253-261, 1 fig., 2 tab., London, May, 1935.

(4) "The Ellipticity Correction in Seismology," *Ibid.*, 271-274.

2781. JEFFREYS, Harold, "Earthquakes and Mountains," Methuen and Co., 179 pp., 6 pl., 9 maps, and diag. Price 7s. 6d. London, 1935.

A review signed G.L.E. appears on pp. 332-333 of the *Geological Magazine*, No. 853, Vol. 72, London, July, 1935. Another, signed A. W. Rogers, appears on pp. 219-222, *The Observatory*, No. 734, Vol. 58, London, July, 1935.

2782. JEFFREYS, Harold and BULLEN, K. E., "Times of Transmission of Earthquake Waves," *U.G.G.I., Ass. Séis., Trav. Sc.*, Ser. A., Fasc. 11, 1-106, num. tab., Strasbourg, 1935.

This report, covering in considerable detail an extended study of a mass of data, is divided into three sections: a discussion of the theory involved, a concise presentation of the resulting tables, and a tabulation of the data upon which the work is based.

2783. JONES, Austin E., "Earthquakes Associated with the 1933 Eruption of Mauna Loa, Hawaii," *Jour. Wash. Acad. Sc.*, Vol. 24, No. 10, 413-418, 1 fig., 2 tab., bib., Washington, Oct. 15, 1934.

2784. KAC, A. and PIVOVAROV, V., "Über die Schwingungen von feinen Metallbänden" (in Russian), *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 51, 12 pp., 8 fig., 3 tab., Leningrad, 1935. N.V.R.

— KANAI, Kiyoshi and SEZAWA, Katsutada,

(1) "M<sub>2</sub> Seismic Waves."

(2) "Decay in the Seismic Vibrations of a Structure by Dissipation of their Energy into the Ground."

(3) "Discontinuity in the Dispersion Curves of Rayleigh Waves," and "Decay Constants of Seismic Vibrations of a Surface Layer."

See No. 2827 of this list.



2785. KATO, Yosio, "Seismic and Volcanic Activities and Changes in the Earth's Magnetic Field (The third paper)," *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 2, 237-243, 4 fig., 4 tab., Tokyo, 1935.

— KATO, Yosio and NAKAMURA, Saemontaro, "Researches on the Terrestrial Magnetism and the Earth's Potential Specially Referred to the Occurrence of Earthquakes and Volcanic Activity." See No. 2800 of this list.

2786. KÖHLER, R. and RAMSPECK, A., "Übertragung von Maschinenschwingungen auf Boden und Gebäude," *Zeit. Tech. Phys.*, Vol. 14, No. 11, 512-514, Leipzig, 1933.

A summary of the data of the above paper was published, with the same title, in *Zeit. Angew. Math. Mech.*, Bd., 13, No. 6, p. 435, Berlin, Dec., 1933.

A paper by Köhler alone, bearing the title, "Resonanzschwingungen des Untergrundes und ihre Bedeutung für Gebäude," was published in *Deut. Phys. Ges. Verh.*, Bd. 3, Heft 14, 12-13, Berlin, 1933. C.A.H.

2787. LACOSTE, Lucien J. B., "A Simplification in the Conditions for the Zero-length-spring Seismograph," *Bul. S.S.A.*, Vol. 25, No. 2, 176-179, 1 fig., Stanford, Apr., 1935.

The zero-length-spring seismograph to which reference is here made was described by LaCoste in 1934 (Item 2298 of these lists). The author's abstract of the present paper reads as follows: "It has been found that for the zero-length-spring seismograph recently described, the length of the arm need not equal the distance from the pivot to the point of attachment of the spring. The proof of the infinite period is given for the more general case, and the effect on the period of slight deviations from the conditions for infinite period is shown."

2788. LACOSTE, J. and BOIS, C., "Remarques au sujet du premier mouvement du sol lors des tremblements de terre intéressant quelques régions européennes," *C.R.*, T. 200, No. 25, 2106-2108, Paris, June 17, 1935.

2789. LANDSBERG, H., "The Problem of Earthquake Prediction," *Science*, No. 2115, Vol. 82, p. 37, New York, July 12, 1935.

2790. LEE, A. W., "The Three Components of Microseismic Disturbance at Kew Observatory: Discussion of the Records for 1932," *Geoph. Mem. Meteor. Off.*, No. 66, Vol. 7, No. 9, 1-10, 5 fig., 5 tab. bib., London, 1935.

The publication may be purchased from H. M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, for 1 shilling, net.

2791. LEE, Frederick W., "Geophysical Abstracts," No. 73, 1425-1451, May; No. 74, 1452-1482, June; No. 75, 1483-1514, July; Washington, 1935. F.W.L.

2792. LEGGETTE, R. M. and TAYLOR, G. H., "Earthquake Instrumentally Recorded in Artesian Wells," *Bul. S.S.A.*, Vol. 25, No. 2, 169-175, 3 fig., bib., Stanford, Apr., 1935.

2793. LEJAY, P., "Les caractères généraux de la gravité le long de la côte sud de Chine," *C.R.*, T. 199, No. 26, 1589-1591, Paris, 1934.

2794. LHEZ, Remigio E., "Método de prospección sísmica," *Boletín de Informaciones Petroleras*, Año 12, No. 127, 57-78, 12 fig., Buenos Aires, Mar., 1935.

The paper is a translation, re-arrangement, and amplification of a paper by Dr. G. A. Boutry, bearing the title, "Les méthodes géophysiques de prospection appliquées à la recherche du pétrole." Y.P.F.

- MACELWANE, James B., S.J., and BRUNNER, G. J., S.J., "The Brunner Focal Depth-Time-Distance Chart." See No. 2745 of this list.

2795. MATUZAWA, Takeo, "Seismometrische Untersuchungen des Erdbebens vom 2, März 1933: II. Analyse der in Californien beobachteten Oberflächenwellen," *Bul. Eq. Res. Inst.*, Vol. 13, Part 2, 328-334, 6 fig., Tokyo, June, 1935.

2796. METEOROLOGICAL COMMITTEE, BRITISH AIR MINISTRY, "The Observatories Year Book, 1933," 450 pp. Price 2s. net. London, 1935.

On pages 362-366 appears the report of the seismological work of Kew Observatory for the year indicated. On pages 425-436 are given the records of earthquakes and microseisms as observed at the same station.

- MIURA, T. and HONDA, H., "On the Strain Produced in a Semi-infinite Elastic Solid by Static Surface Force, with Some Applications to Seismology." See No. 2774 of this list.

2797. MIYABE, Naomi,

- (1) "Notes on the Block Structure of the Earth's Crust," *Bul. Eq. Res. Inst.*, Vol. 13, Part 2, 280-285, 2 fig., Tokyo, June, 1935.
- (2) "Deformation of the Earth's Crust in the Iwato and Miyagi Prefectures," *Ibid.*, 286-306, 19 fig.
- (3) "Correction to my Paper Entitled 'Blocks in the Earth's Crust and Their Movements, Part I,'" *Ibid.*, 306-309.

- MIYABE, Naomi and TERADA, Torahiko,

- (1) "Hot Springs and Deformation of Earth's Crust, II."
- (2) "Relation between Topography and Vertical Displacement of the Earth's Crust."

See No. 2836 of this list.

2798. MOSS, E. B., "The Amplification of Galvanometer Deflexions," *J.S.I.*, Vol. 12, No. 5, 141-148, 7 fig., bib., London, May, 1935.

- NAGAZAWA, Takeo, NAKAHARA, Magokiti, and SUZUKI, Seitaro, "The Revision of Precise Levelling along the Coast of the Hakata Bay." See No. 2833 of this list.

- NAKAHARA, Magokiti, SUZUKI, Seitaro, and NAGAZAWA, Takeo, "The Revision of Precise Levelling along the Coast of the Hakata Bay." See No. 2833 of this list.

2799. NAKAMURA, Saemontaro, "The Geophysical Observations of the Tunami (Tidal Waves) on March 3, 1933," *Ziho Saito Gratitude Found.*, Vol. 88, 1-12, Sendai, 1934.

An abstract by the author appears on pages (21) and (22) of the abstracts section of the *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 3, Tokyo, 1935.

2800. NAKAMURA, Saemontaro and KATO, Yosio, "Researches on the Terrestrial Magnetism and the Earth's Potential Specially Referred to the Occurrence of Earthquakes and Volcanic Activity," *Ann. Rep. Saito Gratitude Found.*, Vol. 10, 50-71, Sendai, 1934.

2801. NAKANO, Masito,

- (1) "On the Depth Distribution of Hakodate Bay as Influenced by the Action of Prevailing Winds," *Proc. Imp. Acad.*, Vol. 11, 180-182, 1 fig., Tokyo, 1935.
- (2) "Depth Distribution of Mano Bay (Sado Island) as Influenced by the Action of Prevailing Winds," *Ibid.*, 183-185, 3 fig.
- (3) "An Investigation on the Effect of Prevailing Winds upon the Depth of Bays," 3 papers, *Geoph. Mag.*, Vol. 9, No. 1, 105-137; 139-160; 161-174; 14 fig.; 13 fig.; 15 fig.; Tokyo, 1935. M.N.

2802. NASU, Nobuji,

- (1) "Errors in the Seismic Triangulation," *Jap. Jour. Ast. Geoph.*, Vol. 12, No. 3, 245-278, 15 fig., num. tab., Tokyo, 1935.
- (2) "Supplementary Study on the Stereometrical Distribution of the After-shocks of the Great Tango Earthquake of 1927," *Bul. Eq. Res. Inst.*, Vol. 13, Part 2, 335-399, 58 fig., 10 tab., Tokyo, June, 1935.
- (3) "Recent Seismic Activities in the Idu Peninsula (Part II)," *Ibid.*, 400-416, 9 fig.
- (4) "The Great Indian Earthquake of January 15, 1934," *Ibid.*, 417-432, 20 illus.

2803. NATURE. Brief notes of interest to seismologists have appeared recently in various numbers of Vol. 135 of the above periodical, as follows:

- (1) "The Distribution of Earthquakes," No. 3409, p. 348, Mar. 2, 1935.
- (2) "Prize in Geophysics Offered by the Pontifical Academy of Sciences," No. 3415, p. 578, Apr. 13, 1935.
- (3) "Study of Earthquakes in California," No. 3416, p. 267, Apr. 20, 1935.
- (4) "Synchronous Time Motors and Accurate Time Keeping," *Ibid.*
- (5) "The Formosa Earthquake," No. 3417, p. 646, London, Apr. 27, 1935. F.D.H.
- (6) "The Baluchistan Earthquakes of 1931," *Ibid.*, p. 661. F.D.H.
- (7) "Earthquakes in Persia," No. 3418, 758-759, May 4, 1935.
- (8) "Earthquake Magnitude Scale," No. 3420, p. 842, May 18, 1935.
- (9) "Physical Methods in the Study of Earth Structure," *Ibid.*, 844-845.
- (10) "A Sine Curve Crack in Natural Ice," No. 3421, p. 877, 1 illus., May 25, 1935.
- (11) "Systems of Echo Sounding," No. 3422, 896-900, 8 fig., June 1, 1935.
- (12) "Earthquakes in Sussex (1835)," *Ibid.*, p. 930.
- (13) "The Quetta Earthquake of May 31," No. 3423, p. 948, June 8, 1935.
- (14) "The Quetta Earthquake," No. 3424, p. 986, June 15, 1935.
- (15) "Landslides in Japan," *Ibid.*, p. 1004.
- (16) "Prediction of Earthquakes," No. 3426, p. 1078, June 29, 1935.

2804. NAVARRO NEUMANN, M. Ma. S., S.J., "Le R. P. Bonaventure Berloty, S.J.," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 1-2, 76-79, Rome, 1935. G.A.

The above is an obituary of the late Fr. Berloty who died October 10, 1934.

2805. NILSSON, Gerhard, "Die Ursache der atmosphärischen Unruhe und der tektonischen Beben," 13 pp., Stockholm, 1933. G.N.

The above booklet (5" x 7") is copyrighted and appears to have been printed privately.

2806. NOMURA, Yukiti, "On Rayleigh Waves over the Circular Cylindrical Surface of an Elastic Body," *Proc. P-M. Soc. Jap.*, Third Series, Vol. 17, No. 5, 151-162, 2 fig., Tokyo, May, 1935.

2807. NOWACK, Ernst, "Erdbeben als Anzeichen von Erdumgestaltungen," *Der Naturforscher*, Jahr. 11, Heft 1, 8-13, 7 fig., Berlin-Lichterfelde, Apr., 1934.

A particular study of the latest earthquakes in the Balkan region (April, 1928, to September, 1932). R.Z.

2808. OTTO, H., "A New High-precision Clock, Embodying Schuler's Free Pendulum," *Horological Jour.*, No. 923, Vol. 77, p. 332 seq., London, July, 1935.

This article is continued from the June issue of the *Journal* and is not concluded in the July issue.

2809. OTUKA, Yanosuke, "Median Dislocation Line of Southwest Japan and the Nagasaki 'Dreiecke'," *Bul. Eq. Res. Inst.*, Vol. 13, Part 2, 457-470, map, Tokyo, June, 1935.

The paper is in Japanese with a full abstract in English.

2810. OXFORD UNIVERSITY, "The International Seismological Summary, 1930, October, November, December," 311-426, Oxford, 1935.

2811. PASTOR, A. Rey, "Datos sísmicos de la península Ibérica, 4° trimestre de 1934," 4 pp., 2 fig., 2 tab., reprinted from *Ibérica*, No. 1066, Vol. 43, Barcelona, Apr. 6, 1935.

A.P.R.

2812. PASTOR, A. Rey, "Carta de sismicidad del globo para el periodo 1899-1930," Instituto Geografico y Catastral, Servicio Sismologico, 12 pp., map, Toledo, 1935.

The author here supplements the compilation prepared by Dr. Heck of the U.S. Coast and Geodetic Survey, Washington, D.C., which was reported as No. 2534 (1).

A.R.P.

2813. PEKERIS, Chaim L., "The Propagation of Rayleigh Waves in Heterogeneous Media," *Physics*, Vol. 6, No. 4, 133-138, 1 fig., bib., New York, Apr., 1935.

The author's summary reads: "A method is given for obtaining a power series expansion in the wave-length for the Rayleigh wave velocity in a half-space whose density  $\rho$  and elastic constants  $\lambda$  and  $\mu$  are functions of depth. This is followed by a discussion of the Rayleigh wave problem in media where  $\lambda = \mu$  and  $\mu(z)$  and  $\rho(z)$  are special cases of the type  $(\rho/\rho_0) = (\mu/\mu_0) = A \cosh^2(\alpha + \beta z)$ ."

A supplementary note entitled: "The Propagation of Rayleigh Waves in Heterogeneous Media—An Addition," appears in the same publication, Vol. 6, No. 5, p. 178, May, 1935. C.L.P.



2814. PIATTI, Vincenzo, "La previsione dei terremoti," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 1-2, 22-42, bib., Rome, 1935. G.A.

— PIVOVAROV, V. and KAC, A., "Über die Schwingungen von feinen Metallbänden." See No. 2784 of this list.

2815. PROVIERO, A., "Il dissincronismo in sismometria alle prove della piattaforma oscillante (per il case di  $T > T_0$ ) Nota II," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 1-2, 43-49, 6 fig., bib., Rome, 1935. A.P.

— RAMSPECK, A. and KÖHLER, R., "Übertragung von Maschinenschwingungen auf Boden und Gebäude." See No. 2786 of this list.

2816. REICH, H., "Über die deutsche geophysikalische Reichsaufnahme," *Bei. Angew. Geoph.*, Bd. 5, Heft 2, 143-151, Leipzig, 1935.

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N.V.R.



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- (4) Hulin, Carlton D., "Mechanics of Fault Movements," p. 323.
- (5) Delaney, John P., S.J., "Seismographic Sensitivity to Tilt," p. 443.
- (6) DeLury, Justin S., "Causes of Elevation and Depression," p. 455.
- (7) Eby, J. Brian, "Relation of Geophysics to Gulf Coast Domes and Oilfields," p. 443.
- (8) Heck, N. H., "Earthquakes of the Appalachian Mountain Region," p. 446.
- (9) Lambert, Walter D., "Geoid, Spheroid, and Isostasy," p. 449.
- (10) McComb, H. E., "Instruments Used at Seismograph Stations in the Appalachian Region," p. 449.
- (11) Rutherford, H., "Method for the Reduction of Seismic Reflection Data," p. 452.
- (12) Sellards, Elias Howard, "Texas-Oklahoma Earthquake of April 11, 1934," p. 453.
- (13) Van Orstrand, C. E., "Normal Geothermal Gradient in the United States," p. 455.

2877. GILL, J. E., "Normal and Reverse Faults," *Jour. Geol.*, Vol. 43, No. 8, 1071-1079, 10 fig., Chicago, Nov.-Dec., 1935.

2878. GLENNIE, E. A.,

- (1) "Gravity," *Geodetic Report, Survey of India, 1934*, Chap. 3, 42-67, 8 pl., 11 charts, Calcutta, 1935.

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- (2) "Crustal Warping in the United States," *Ger. Bei.*, Bd. 46, Heft 1-2, 193-197, 2 fig., bib., Leipzig, 1935.

Author's Summary: Isostatic anomalies in the United States and southern Canada are examined and a marked relation between them and latitude and elevation is found. The correlation with height appears to be quantitatively similar to that found in India. It is concluded therefore that the warp anomalies which have proved useful in India will also effectively portray the tectonic structure in the United States and the method by which they may be derived is given.

— GORŠKOV, G. P., "On the Isogravitational Surfaces." See No. 2842 (7) of this list.

— GRENET, G. and COULOMB, J., "Nouveaux principes de construction des séismographes électromagnétiques." See No. 2863 of this list.

— GRIGGS, David T., "Plasticity of Rocks under High Pressure (abstract)." See No. 2876 (1) of this list.

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2880. GULATEE, B. L., "The Boundary Problems of Potential Theory and Geodesy," *Ger. Bei.*, Bd. 46, Heft 1-2, 91-98, 3 fig., bib., Leipzig, 1935.

— GUTENBERG, Beno and BUWALDA, John P., "Seismic Methods Applied to the Bighorn Basin (abstract)." See No. 2876 (2) of this list.

2881. GUTENBERG, Beno and RICHTER, C. F.,

- (1) "On Seismic Waves" (second paper), *Ger. Bei.*, Bd. 45, Heft 3, 280-360, 16 fig., 26 tab., bib., Leipzig, 1935. B.G.
- (2) "Revised and Additional Geocentric Coördinates of Seismological Stations," *Ibid.*, Bd. 46, Heft 1-2, 198-201, 1935. B.G.

The first of the above papers continues the important discussion of seismic data begun in a paper bearing the same title and reported as No. 2637 of these lists. The second supplements the paper reported as No. 2043 of these lists.

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— HASKELL, N. A., "The Motion of a Viscous Fluid under a Surface Load with Particular Reference to the Pleistocene Ice-Sheets." See No. 2847 (10) of this list.

2883. HAYASAKA, Ichiro, "A Geological Note on the Taiwan Earthquake of April 21, 1935," *Proc. Imp. Acad.*, Vol. 11, No. 7, 265-267, Tokyo, July, 1935.

2884. HAYES, R. C.,

- (1) "A Summary of New Zealand Earthquakes for the Period 1903-1920," *Dom. Obs. (N.Z.) Bul.*, No. 99, 2 pp., Wellington, 1935.
- (2) "Earthquake Frequency in New Zealand, Seasonal and Diurnal Variations," *Ibid.*, No. 104, 6 pp., 2 fig., bib., 1935. R.C.H.

— HECK, N. H., "Progress in Seismology of United States Coast and Geodetic Survey and Co-operating Institutions." See No. 2847 (6) of this list.

— HECK, N. H., "Earthquakes of the Appalachian Mountain Region (abstract)." See No. 2876 (8) of this list.

2885. HECKER, O., "Möglichkeiten der Erforschung des Erdinnern," Gustav Fischer, 26 pp., 8 fig., Stuttgart, Mar., 1935.

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2886. HERRMANN, A. and MEISSER, O., "Ein piezoelektrischer Beschleunigungsmesser," *Zeit. Geoph.*, Jahr. 11, Heft 3, 152-153, 2 fig., bib., Braunschweig, 1935.

2887. HODGKINSON, J., "A Supposed Property of Wave-Fronts," *Quart. Jour. Math.*, Vol. 6, No. 24, 316-320, Oxford, 1935.

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— HULIN, Carleton D., "Mechanics of Fault Movements (abstract)." See No. 2876 (4) of this list.

2888. HUME, G. S., "Central Turner Valley and Some Types of Foothills' Faults," *Trans. R.S.C.*, Third Series, Vol. 29, Section 4, 129-138, 4 fig., bib., Ottawa, May, 1935.

2889. HUNTER, J. de Graaff, "The Figure of the Earth from Gravity Observations and the Precision Obtainable," *Phil. Trans. Roy. Soc.*, Series A. Mathematical and Physical Sciences, No. 743, Vol. 234, 377-431, London, July 15, 1935.

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2890. IDE, John M., "Some Dynamic Methods for Determination of Young's Modulus," *R.S.I.*, Vol. 6, No. 10, 296-298, 1 fig., 1 tab., bib., Lancaster, Oct., 1935.

2891. IDA, Kumizi,

(1) "Pulsatory Oscillations of the Earth's Crust due to Surface Force," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 504-518, 13 fig., bib., Tokyo, Sept., 1935.

(2) "Changes in Rigidity and Internal Friction of Amorphous Silicia with Temperature," *Ibid.*, 665-680, 10 fig., 4 tab., bib.

— IRLAND, G. A., "A Study of Some Seismometers." See No. 2847 (7) of this list.

2892. ISHIMOTO, Mishio, "Observations accélérométriques des secousses sismiques dans les villes de Tokyo et Yokohama (II)" (in Japanese with short abstract in French), *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 592-607, 12 fig., Tokyo, Sept., 1935.

2893. JACOBSEN, L. S. and JESPERSEN, H. J., "Steady Forced Vibrations of Single Mass Systems with Symmetrical and Unsymmetrical Non-linear Restoring Elements," *Jour. Frank. Inst.*, Vol. 220, No. 4, 467-496, 19 fig., Philadelphia, Oct., 1935.

2894. JAGGER, J. G., "Vibration of an Elastic Column," *Phil. Mag.*, No. 136, Vol. 20, 997-1000, London, Nov., 1935.

2895. JEFFREYS, Harold, "Constitution of the Earth," *Nature*, No. 3418, Vol. 135, 678-680, London, 1935.

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— JESPERSEN, H. J. and JACOBSEN, L. S., "Steady Forced Vibrations of Single Mass Systems with Symmetrical and Unsymmetrical Non-linear Restoring Elements." See No. 2893 of this list.

2896. JOHNSON, Frank M. S., "Engineering Seismology," *Mines Mag.*, Vol. 25, No. 12, 24-29, 36, 1 fig., Golden, Dec., 1935.

2897. JONES, Austin E., "Earthquakes Associated with the 1934 Eruption of Kilauea, Hawaii," *Jour. Wash. Acad. Sc.*, Vol. 25, No. 10, 429-435, 2 fig., 2 tab., bib., Washington, Oct. 15, 1935.

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2898. JONES, Owen Thomas, "Geophysics," *Engineering*, Vol. 139: No. 3617, 448-489, May 10, 1935; No. 3620, 583-585; No. 3621, 613-614, London, 1935.

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- KANAI, Kiyoshi and NISHIMURA, Genrokuro, "On the Effect of Discontinuity Surfaces on the Propagation of Elastic Waves (VI)." See No. 2916 of this list.

2899. KAWASUMI, Kiroshi and YOSIYAMA, Ryoiti, "On an Elastic Wave Animated by the Potential Energy of Initial Strain," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 496-503, Tokyo, Sept., 1935.

2900. KEYES, Charles, "Ultimate Test of Duttonian Isostasy," *Pan-Amer. Geol.*, Vol. 64, No. 3, 193-220, 12 fig., bib., Des Moines, Oct., 1935.

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2901. KISHINOUE, Fuyuhiko, "On Microseisms of Four Second Period (II)," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 608-615, 4 fig., bib., Tokyo, Sept., 1935.

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2902. KURIHARA, Kaname, "On the Transmissibility of Long Waves along a Canal when there are Abrupt Changes in Depth," *Proc. Imp. Acad.*, Vol. 11, No. 8, 316-318, 1 fig., Tokyo, Oct., 1935.

- LAMBERT, Walter D., "Geoid, Spheroid, and Isostasy (abstract)." See No. 2876 (9) of this list.

- LANDSBERG, H., "Some Correlations between the Occurrence of Deep- and Shallow-focus Earthquakes." See No. 2847 (3) of this list.

- LANE, H. C. and DELURY, Justin S., "Radioactivity and Geothermal Gradients." See No. 2867 of this list.

- LAW, Russell R. and BIRCH, Francis, "Measurement of Compressibility at High Pressures and High Temperatures." See No. 2851 of this list.

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2904. LEE, L. Don, "When the Earth Shakes," *Telescope*, Vol. 2, No. 5, 102-108, 6 fig., Cambridge, Sept.-Oct., 1935.

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2905. LÚNKENHEIMER, F.,

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- (2) "Resultados sismométricos del año 1929," *Ibid.*, No. 4, p. 195.
- (3) "Las fluctuaciones de las manchas solares y la sismicidad general de la Tierra," *Ibid.*, No. 2, 95-105.
- (4) "El período anual de la sismicidad general de la Tierra," *Ibid.*, No. 3, 109-111.  
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— MICHLIN, S., "Le problème plan de la théorie statique d'élasticité," and "Le problème plan d'élasticité pour un milieu hétérogène." See Nos. 2842 (8) and (9) of this list.

2908. MIHAILOVIĆ, J., *Annuaire microséismique, année xiv, 1934,* *Pub. Inst. Séis., Univ. Beograd, Series A*, 33 pp., Beograd, 1935.

2909. MINIKAMI, Takeshi, "The Explosive Activities of Volcano Asama in 1935 (I)," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 629-644, 31 fig. (Mostly half-tone plates), Tokyo, Sept., 1935.

2910. MIYABE, Naomi,

- (1) "Sinking of the Earth's Crust in Hukagawa, Tokyo, as Deduced from Mareogram Data," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 587-591, 4 fig., 1 tab., bib., Tokyo, Sept., 1935.
- (2) "Notes on the Block Structure of the Earth's Crust," *Scientia*, Vol. 59, No. 285-1, 15-19, 2 fig., 2 tab., Bologna, 1936.

— MIYABE, Naomi and TERADA, Torahiko, "Geographical Distribution of Hot and Mineral Springs and Deformation of Earth's Crust." See No. 2932 of this list.

2911. MONTHLY EVENING SKY MAP. The above publication (Vol. 29, Whole No. 348, Brooklyn, Dec., 1935) contains two references to earthquakes, as follows:

- (1) "Scientists Baffled by Brazilian Earthquakes," p. 2.
- (2) "Moon's Influence is Seen in Quake," p. 4.

2912. MÜLLER, H. K., "Vergleich von Laufzeitkurve und Gang des Emergenzwinkels bei Sprengungen," *Zeit. Geoph.*, Jahr. 11, Heft 3, 111-115, 3 fig., 2 tab., bib., Braunschweig, 1935.

— MUSHKETOV, D., "On Seismicity of the Arctic." See No. 2842 (5) of this list.

2913. NATURE. The following notes of interest to seismologists have appeared in Vol. 136 of the above periodical:

- (1) "Equipment of a Photo-elastic Laboratory," No. 3430, p. 136, London, July 27, 1935.
- (2) "Bibliography of Seismology," *Ibid.*, 138-139.
- (3) "Special Train for First Aid in Germany," *Ibid.*, p. 140.
- (4) "Chinese Loess Deposits," *Ibid.*, p. 150.
- (5) "The Seismological Station of De Bilt," No. 3432, p. 217, August 10, 1935.
- (6) "Earthquake in Lancashire," No. 3433, p. 272, Aug. 17, 1935.
- (7) "Bibliography of Seismology," No. 3434, p. 295, Aug. 24, 1935.
- (8) "Quetta Earthquake of May 31," No. 3435, p. 331, Aug. 31, 1935.
- (9) "A New Wave Characteristic of Deep-focus Earthquakes," *Ibid.*, pp. 337-338.
- (10) "Destructive Earthquakes in 1934," No. 3438, pp. 472-473, Sept. 21, 1935.
- (11) "The Bihar Earthquake of 1934," *Ibid.*, pp. 485-486.
- (12) "Recent Earthquakes," No. 3439, p. 510, Sept. 28, 1935.
- (13) "Distribution of Earthquakes in New Zealand," *Ibid.*, pp. 519-520.
- (14) "The Typhoon of September 21, 1934, in Japan," No. 3440, p. 544, Oct. 5, 1935.
- (15) "Nevada Earthquake of 1934," No. 3442, p. 649, Oct. 19, 1935.
- (16) "Surface Structure beneath the Pacific," No. 3444, p. 723, Nov. 2, 1935.
- (17) "Canadian Earthquake of November 1," No. 3445, p. 753, Nov. 9, 1935.
- (18) "Seismology in New Zealand," *Ibid.*, p. 763.
- (19) "The Asama-yama (Japan) Eruption of 1935," No. 3448, p. 877, Nov. 30, 1935.
- (20) "Catalogue of Earthquakes, 1925-30," No. 3449, p. 907, Dec. 7, 1935.
- (21) "Investigation of British and Irish Earthquakes," *Ibid.*, p. 907.
- (22) "An Earthquake Research Commission for India," *Ibid.*, p. 907.
- (23) "Tokyo Earthquakes in 1934," *Ibid.*, p. 919.
- (24) "Earthquakes and Rainfall," No. 3450, pp. 958-959, Dec. 14, 1935.
- (25) "Surface Structure beneath the Pacific," No. 3451, p. 990, Dec. 21, 1935.
- (26) "Horizontal Distortion of the Earth's Crust near Tokyo," *Ibid.*, p. 993.

2914. NAVARRO NEUMANN, M. Ma. S., S.J., "Notas sísmicas de 1934," *Ibérica*, No. 1092, 7 pp. in reprint, 5 fig., Barcelona, Nov. 2, 1935. N.N.

2915. NEUMANN, Frank, "United States Earthquakes 1933," *U.S.C.G.S. Pub.*, No. 579, 82 pp. Price 10 cents. Washington, 1935.

In addition to the usual data there appears on pp. 80-81 a most interesting account of the tilt observations made on the Hayward fault in California previous to the earthquake of May 16, 1933.

2916. NISHIMURA, Genrokuro and KANAI, Kiyoshi, "On the Effect of Discontinuity Surfaces on the Propagation of Elastic Waves (VI)" (In Japanese with short abstract in English), *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 519-539, 5 fig., Tokyo, Sept., 1935.

Immediately following the above is Part VII of the same series of papers, by Nishimura only, covering pages 540-554. It, too, is in Japanese with a short summary in English.

- NOVOTORZEV, V. I., "Method of Successive Approximations Applied to the Study of Vibrations of Structures. The Second Frequency of Free Vibrations of Prismatic Bars." See No. 2842 (10) of this list.

2917. OBSERVATORY. In the June issue of *The Observatory* (No. 733, Vol. 58, 192-194, London, 1935) appear two brief notes of interest to seismologists entitled respectively "Isostatic Adjustment" and "Audible Phenomena of Earthquakes." They are each signed R. S. and are in the nature of reviews of published papers on the subjects indicated.

2918. OKADA, T., "The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1934," Central Meteorological Observatory, 70 pp., 3 pl., Tokyo, 1935.

This publication, in addition to reporting the seismic activity of Japan for the year indicated, is a valuable reference for the list of meteorological stations of Japan which are equipped with seismographs. These are tabulated on pp. 67-69, together with their latitude and longitude, the *a*, *b*, *c* values for computation by Turner's method, and the list of seismographs operating at each station. The more important of the Japanese earthquakes for 1934 are discussed in detail with maps.

2919. PAGE, Ben M., "Basin-range Faulting of 1915 in Pleasant Valley, Nevada," *Jour. Geol.*, Vol. 43, No. 7, 690-707, 13 fig., 1 tab., bib., Chicago, Oct.-Nov., 1935.

- PAGE, Ben M., "Fault Scarps of 1915 in Pleasant Valley, Nevada (abstract)." See No. 2876 (3) of this list.

2920. PALAZZO, L., "I recenti terremoti di Montefiascone," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 5-6, 190-194, Rome, 1935.

- PEKERIS, Chaim L., "The Propagation of Rayleigh Waves in Heterogeneous Media." See No. 2847 (8) of this list.

2921. PERRI, Emilio, "Considerazioni sulle vibrazioni del suolo e dei fabbricati," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 5-6, 159-172, 3 fig., bib., Rome, 1935.

PUTSCHKOFF, S. W. and KIRILOFF, F. A., "Die Ausbreitung der durch impulsive Kräfte hervorgerufenen Bodenschwingungen." See No. 2842 (2) of this list.

- RAÏKO, N. and LINDEN, N., "On the Earthquake of 20 XI 1933 in the Baffin Bay and on the Distribution of Epicentres in the Arctic." See No. 2842 (4) of this list.

- RICHTER, C. F. and GUTENBERG, Beno, (1) "On Seismic Waves" (second paper); and (2) "Revised and Additional Geocentric Coordinates of Seismological Stations." See No. 2881 of this list.

2922. RIXMANN, F., "Untersuchungen über die Abhängigkeit der Bodenbewegung bei Sprengungen von der Ladung," *Zeit. Geoph.*, Jahr. 11, Heft 4-5, 197-207, 9 fig., 3 tab., bib., Braunschweig, 1935.

The above paper is No. 18 of the series: *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

2923. ROY, S. C., "Seismometric Study of the North Bihar Earthquake of January 15, 1934, and its Aftershocks," *Current Science*, Vol. 3, No. 7, 298-300, Bangalore, 1935.
- RUTHERFORD, H., "Method for the Reduction of Seismic Reflection Data (abstract)." See No. 2876 (11) of this list.
2924. SANDSTRÖM, J. W., "Geophysische Untersuchungen im Nordatlantischen Meer (IV Mitteilung)," *Ger. Bei.*, Bd. 45, Heft 1-2, 1-4, 5 fig., Leipzig, 1935.
2925. SCIENCE. In No. 2120 (Vol. 82) of the above periodical for Aug. 16, 1935, appear two notes of interest to seismologists, as follows:
- (1) "The Bending of the Earth's Crust Due to Boulder Dam Construction," p. 7 (Supp.)
  - (2) "Pacific Ocean Bottom Rock Different from Rocks found Elsewhere," p. 8 (Supp.)
2926. SCIENCE NEWS-LETTER. The following notes of interest to seismologists appear in Vol. 28 of the above periodical as follows:
- (1) "South American Quake Almost on Equator," No. 749, p. 102, Washington, Aug. 17, 1935.
  - (2) "Seismograph Records Breaking of Drought," *Ibid.*, p. 104.
  - (3) "Earthquake Strikes Baffin Bay Region," No. 752, p. 149, Sept. 7, 1935.
2927. SELL, H. and TURETSCHKE, G., "Quantitative Messung von Erschütterungen," *Zeit. Tech. Phys.*, Bd. 15, No. 12, 644-652, Leipzig, 1934.
- SELLARDS, Elias Howard, "Texas-Oklahoma Earthquake of April 11, 1934 (abstract)." See No. 2876 (12) of this list.
- SHARPE, J. A., "Motion of the Surface of the Earth in the Compressional Phase of a Deep-focus Earthquake, and the Effects of a Layered Crust." See No. 2847 (4) of this list.
2928. SHEPARD, E. R., "Searching for Foundation Beds by Electricity and Sound," *Eng. N.-R.*, Vol. 115, No. 7, 228-232, 7 fig., bib., New York, Aug. 15, 1935. R.R.B.
- See also Nos. 2828 and 2873 of these lists.
- SHEPARD, E. R., "Subsurface Exploration by Earth-resistivity and Seismic Methods." See No. 2847 (2) of this list.
2929. SIMON, Béla, "Radó de Kövesligethy," *Bol. Soc. Sis. Ital.*, Vol. 33, No. 5-6, 200-205, 1 portrait, bib., Rome, 1935.
- An obituary of Prof. Kövesligethy who died October 11, 1934.
- SLICHTER, L. B., "A Three-Component Portable Seismometer Designed for the Evaluation of Ground Motions." See No. 2847 (1) of this list.
- SOHON, F. W., S.J., "The Electrodynamic Ratio of the Galitzin Seismometer." See No. 2847 (5) of this list.



2930. SOLDAN, Francisco Alayza Paz, "Construcciones especiales contra terremotos," *Bol. Soc. Geog. Lima*, Tomo 52, No. 3, 195-213, Lima, Sept. 30, 1935.

The two preceding parts of this paper were reported respectively as Nos. 2591 and 2710 of these lists.

- SPIVAK, Joseph and DeLURY, Justin S., "Concomitants of Diverse Geothermal Gradients." See No. 2868 of this list.
- STONELEY, R., "The Long Wave Phase of Earthquakes." See No. 2856 (1) of this list.
2931. TERADA, Torahiko, "Colloids and Seismology," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 562-568, Tokyo, Sept., 1935.
2932. TERADA, Torahiko and MIYABE, Naomi, "Geographical Distribution of Hot and Mineral Springs and Deformation of Earth's Crust," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 576-586, 17 fig., bib., Tokyo, Sept., 1935.
2933. THORKESSON, Thorkell, "Frequency Distribution of Macroseisms at Reykjavik since 1800," *Vísindafélag Íslendinga (Societas Scientiarum Islandica)*, Greniar I.I., 3 pp., tab., Reykjavik, 1935.
2934. TSUBOI, Chuji, "Recent Changes in Area of the Base Line Rhombus at Mitaka," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 558-561, 2 fig., 1 tab., Tokyo, Sept., 1935.
- TURETSCHKE, G. and SELL, H., "Quantitative Messung von Erschütterungen." See No. 2927 of this list.
2935. TYRRELL, G. W., "The Macroseismic Evidence of Four Recent Scottish Earthquakes," *Trans. Geol. Soc. Glasgow*, Vol. 19, Part I, 1931-1932.
- The earthquakes discussed are:
- (1) The Oban earthquake of 1925, December, 23<sup>d</sup> 12<sup>h</sup>.
  - (2) The North Sea earthquake of 1927, January, 24<sup>d</sup> 5<sup>h</sup>.
  - (3) The Collentraive earthquake of 1927, January, 27<sup>d</sup> 9<sup>h</sup>.
  - (4) The Lochgilphead earthquake of 1927, January, 27<sup>d</sup> 16<sup>h</sup>.
- VAN ORSTRAND, C. E., "Normal Geothermal Gradient in the United States (abstract)." See No. 2876 (13) of this list.
2936. VASILIEV, M. V., "Contribution to the Question of the Interpretation of Seismic Surveys" (in Russian), *Informazionniy Sbornik, N.G.R.I. (Informative Symposium of the Oil Geologic Research Institute)*, 148-157, Moscow, 1934.
- An abstract by W. Ayvazoglou appears on page 1523 of *Geophysical Abstracts*, No. 76, reported as No. 2903 of this list. F.W.L.
2937. VERCELLI, F., "La determinazione delle profondità ipocentrali," *Bollettino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Ricerche*, Second Series, Anno V, No. 1, 15-20, bib., Milan, Jan., 1935.

2938. WATTS, W. W., "Form, Drift, and Rhythm of the Continents," *Pan-Amer. Geol.*, Vol. 64, No. 2, 81-98, Des Moines, Sept., 1935. Concluded in the succeeding issue, No. 3, 179-184.

The above is the text of the Presidential Address before the British Association for the Advancement of Science, Norwich Meeting, Sept. 4, 1935.

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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.

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SUBJECT INDEX FOR THE YEAR 1935

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In the same issue of the *Journal*, pp. 73-79, will be found the Constitution and By-laws of the Society, as amended in 1935. On pp. 68-72 appears a list of the Members and on pp. 80-81 is given the list of papers presented at the Wichita meeting of the Society, on March 21, 1935.

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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.

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BY

ERNEST A. HODGSON

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# Bibliography of Seismology

April, May, June, 1936

3042. ACADÉMIE DES SCIENCES DE L'URSS. The following papers of interest to seismologists have recently appeared in the publications of the above organization:

- (1) VARDANJANC (WARDANIANZ), L., "Seismotectonics of the Caucasus" (in Russian), No. 64, 87 pp., 2 pl., Moscow-Leningrad, 1935.
- (2) NOVOTORCEV (NOVOTORZEV), V. I., "Method of Successive Approximations Applied to the Study of Vibrations of Structures. The Effect of Shearing Force, Rotatory Inertia, and Longitudinal Vibrations of Rigid Bents" (in Russian), No. 70, 79 pp., 30 fig., 1935.
- (3) SCHERMANN, D., "Quelques cas spéciaux du problème de la théorie d'élasticité à simmetrie axiale" (in Russian, with short abstract in French), No. 71, 24 pp., bib., 1935.
- (4) ROZOVA, E., "Construction of Travel-time Curves and Determination of Principal Seismic Elements for Central Asia" (in Russian, with short abstract in English), No. 72, 28 pp., 7 fig., 3 pl., 1936. N.V.R.

3043. ADAMS, C. E., "Report of the Dominion Astronomer and Seismologist for the year ended 31st December, 1934." Extract from the *Annual Report of the Department of Scientific and Industrial Research, 1934-35, Dom. Obs. (N.Z.) Bul.*, No. 105, 7 pp., 1 map, Wellington, 1935. C.E.A.

3044. AKIMOV, A. T., "Geophysical Methods above Frozen Ground" (in Russian), *Razvedka Nedr*, Vol. 5, No. 22, 30-33, Moscow, 1935.

An abstract by W. Ayvazoglou appears as No. 3079, p. 1776, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.

— ANDERSON, John A., "Seismometer" (Patent). See No. 3109 (3) of this list.

3045. ARAKAWA, Hidetosi, and YOSITAKE, Motozi, "On the Elevation of the Surface of the Sea under the Influence of a Travelling Low Pressure," *Proc. Phys.-Math. Soc. Jap.*, Third Series, Vol. 18, No. 2, 51-59, 2 fig., 1 tab., bib., Tokyo, Feb., 1936.

3046. BELLUIGI, A.,

- (1) "Recenti sviluppi strumentali nella sismometria mineraria," *L'Industria Mineraria*, No. 1/2, 1-4, Faenza, Jan.-Feb., 1935.
- (2) "L'utilizzazione dei Sondaggi nella prospezione geosismica," *Bol. Soc. Geol. Ital.*, Vol. 54, No. 1, 145-152, Rome, 1935. F.W.L.



3047. BENIOFF, Hugo, "A Linear Strain Seismograph," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 283-309, 20 fig., bib., Berkeley, Oct., 1935.

See also report of abstract on same subject in *Earthquake Notes*, reported as No. 3050 (1) of this list. In the same issue of the *Notes* appears an abstract of a paper by the above author on the subject: "Recent Developments in Seismologic Instruments at the Seismological Laboratory, Pasadena."

- BLAKE, A., "The Results of Strong-motion Measurements" (abstract). See No. 3050 (1) of this list.

3048. BLANCHARD, F. B., and BYERLY, Perry, "A Study of a Well Gauge as a Seismograph," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 313-321, 3 fig., 1 tab., bib., Berkeley, Oct., 1935.

- BLAU, Ludwig W., SLOTNICK, MORRIS M., and STATHAM, Louis, "Compound Seismograph" (Patent). See No. 3109 (12) of this list.

3049. BLUME, John A., "A Machine for Setting Structures and Ground into Forced Vibration," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 361-379, 20 fig., Berkeley, Oct., 1935.

3050. BODLE, Ralph R.,

(1) "Earthquake Notes," Vol. 7, No. 1-2, 26 pp., 7 fig., Washington, Sept., 1935.

(2) "Earthquake Notes," Vol. 7, No. 3, 9 pp., 2 fig., Dec., 1935.

(3) "Earthquake Notes," Vol. 7, No. 4, 9 pp., Mar., 1936.

In addition to a long series of Notes, No. 1-2 reports the proceedings of the Tenth Annual Meeting of the Eastern Section, Seismological Society of America, held at Ottawa, Canada, May 27-28, 1935. An abstract of each of the papers is given. For the titles of these see under the author names in this issue of the *Bibliography*. Papers are presented by: Bradford, Delaney, Blake, Neumann, DeLury, Dahm, Brown, Conant, Henderson, Gibbs, Benioff, Doxsee, Leet, Hodgson, Goldthwait, Sharpe, King, Miller, Bradford and Macelwane, O'Donnell, Bodle, Wenner and Gebhardt, Schon, Heck, Ulrich, Macelwane, Byerly, and Brennan.

In addition to many notes, each of the Nos. 3 and 4 reports details of the earthquakes at Helena and at Timiskaming.

- BODLE, Ralph R., "Some Factors in Epicenter Location" (abstract). See No. 3050 (1) of this list.

3051. BOIS, Ch., "Chronique Sismologique: Les tremblements de terre destructeurs du 1er juillet 1935 au 1er janvier 1936," *Mat. E. Cal.*, No. 36, 160-163, Geneva, 1935.

In the same issue of the journal and immediately following the above paper are two short notes with the respective titles: "Les tremblements de terre et leurs conséquences" (163-166, signed "W"), and "La reconstruction de Quetta" (166-167).

3052. BRADFORD, Donald C.,

(1) "On a Study of Microseisms Recorded at Sitka, Alaska, During the Period from January 1, 1929, to December 31, 1931, Inclusive," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 323-342, 2 fig., 4 tab., bib., Berkeley, Oct., 1935.

- (2) "Microseisms and Their Relationship to Changing Meteorological Conditions," *Ibid.*, Vol. 26, No. 1, 29-53, 1 fig., 5 tab., bib., Jan., 1936. D.C.B.
- (3) "The Relation between Changing Meteorological Conditions and Microseisms Recorded at Saint Louis University" (abstract). See No. 3050 (1) of this list.
- BRADFORD, D. C., and MACELWANE, James B., S.J., "A Preliminary Sketch of the Seismic History of Missouri" (abstract). See No. 3050 (1) of this list.
- BRENNAN, J. F., "The Synchronism of Jamaica Earthquakes with the Periods of Monthly Recurrent Rainfall Means, and with the Monthly Barometric Mean Pressure" (abstract). See No. 3050 (1) of this list.
- BROWN, Charles Wilson, "A Seaquake off the Island of Hawaii, T. H." and "The Rhode Island Earthquake of November 3, 1913" (abstracts). See No. 3050 (1) of this list.
3053. BROWN, J. Coggin, "A Note on the Swa Earthquake of August 8, 1929," *Rec. Geol. Sur. India*, Vol. 66, 244-249, 1933. E.T.
3054. BROWN, J. Coggin, and LEICESTER, P., "The Pyu Earthquakes of 3rd and 4th Dec., 1930, and Subsequent Burma Earthquakes up to Jan., 1932," *Mem. Geol. Sur. India*, Vol. 62, i-iii, 1-140, 1933. E.T.
- BURRARD, S. G., "On the Origin of the Himalaya Mountains" and "Investigations of Isostasy in Himalayan and Neighbouring Regions." See Nos. 3072 (1) and 3072 (4) of this list.
- BYERLY, Perry, "Seismology at the University of California" (abstract). See No. 3050 (1) of this list.
- BYERLY, Perry, and BLANCHARD, F. B., "A Study of a Well Gauge as a Seismograph." See No. 3048 of this list.
3055. BYERLY, Perry, and WILSON, James T.,
- (1) "The Central California Earthquakes of May 16, 1933, and June 7, 1934," *Bul. Seis. Soc. Am.*, Vol. 25, No. 3, 223-246, 8 fig., 6 tab., bib., Berkeley, July, 1935.
  - (2) "The Richmond Quarry Blast of August 16, 1934," *Ibid.*, 259-268, 3 fig., 1 tab., bib.
  - (3) "Northern California Earthquakes April 1, 1933, to March 31, 1934," *Ibid.*, 269-273.
3056. CARDER, D. S., "Observed Vibrations of Steel Water Towers," *Bul. Seis. Soc. Am.*, Vol. 26, No. 1, 69-88, 8 fig., 4 tab., Berkeley, Jan., 1936.
3057. COMBS, Theodore C., "The Strength and Rigidity of Wood Floors as Diaphragms," *Bul. Seis. Soc. Am.*, Vol. 26, No. 1, 55-61, 1 fig., 1 tab., bib., Berkeley, Jan., 1936.
- CONANT, Louis C., "A New and Cheaper Photo-cell Circuit for Recording Time on Seismographs" (abstract). See No. 3050 (1) of this list.

3058. COULOMB, J., "Début des ondes de Love et de Rayleigh." Extract from *Livre jubilaire de Marcel Brillouin* (Gauthier-Villars), 12 pp., bib., Paris, 1935. J.C.
3059. COULSON, A. L., "A Study of the Indian Seismological Records of the Chief Shocks Which Occurred in the N. E. Frontier Region of Burma during 1929-1930," *Rec. Geol. Sur. India*, Vol. 66, 356-387, 1933. E.T.
- COWIE, H. McC., "A Criticism of Mr. R. D. Oldham's Memoir, 'The Structure of the Himalayas and of the Gangetic Plain'." See No. 3072 (5) of this list.
- CRARY, A. P., PEOPLES, J. W., and EWING, Maurice, "Seismic Tests on Anthracite." See No. 3124 (1) of this list.
3060. CRICKMAY, Geoffrey W., and MITCHELL, Lane, "The Southern Appalachian Earthquake of January 1, 1935," *Bul. Seis. Soc. Am.*, Vol. 25, No. 3, 247-251, 1 fig., Berkeley, July, 1935.
- CROSTHWAIT, H. L., "Investigation of the Theory of Isostasy in India." See No. 3072 (2) of this list.
3061. DAHM, Cornelius G.,
- (1) "The Southeastern Illinois Earthquake of October 29, 1934," *Bul. Seis. Soc. Am.*, Vol. 25, No. 3, 253-257, 1 map, Berkeley, July, 1935.
- (2) "Velocity of P-waves in the Earth, Calculated from the Macelwane P-curve, 1933," *Ibid.*, Vol. 26, No. 1, 1-11, 1 fig., 3 tab., bib., Jan., 1936.
- DAHM, Cornelius G., "The Velocities of the P- and S-waves from a Study of the Records of the Long Beach Earthquake" (abstract). See No. 3050 (1) of this list.
3062. DAVISON, Charles, "On the Earthquakes Recorded by the Pendulum Seismograph at Shillong (Assam) from 1903-1931," *Rec. Geol. Soc. India*, Vol. 69, No. 2, 184-202, 1935. E.T.
3063. DAVISON, Charles, "Post-eruptive Movements of the Earth's Crust," *Discovery*, No. 197, Vol. 17, 148-149, 4 fig., bib., London, May, 1936.
3064. DAY, Arthur L., et al., "Report of the Advisory Committee on Seismology," *Car. Inst. Wash., Year Book No. 34*, 360-370, Washington, 1935.
- The report includes the following: Geodetic work in regions of seismic activity, The seismological laboratory, Earthquake activity, Development of instruments, Portable seismograph assembly, Publications, Bibliography. A.L.D.
- DELANEY, John P., S.J., "Seismograph Tilt Recording" (abstract). See No. 3050 (1) of this list.
- DELURY, Ralph E., "Fluctuations in Earthquakes in Relation to Phenomena of the Earth and Solar System" (abstract). See No. 3050 (1) of this list.

3065. DEMING, W. Edwards, "On the Significance of Slopes and Other Parameters Estimated by Least Squares," *Phys. Rev.*, Vol. 49, No. 3, 243-247, bib., Lancaster, Feb 1, 1936.
3066. DISIN. The following papers (in Japanese) appear in Vol. 4 (1932) of the above publication. Abstracts (in English) appear on pages 5-7 of the abstracts section of *Jap. Jour. Ast. Geoph.*, Vol. 13, No. 1, Tokyo, 1935.
- (1) KISHINOUE, Fuyuhiko, "The Direction of the First Motion of an Earthquake in the Kwanto District," 18-25, 6 pl.
  - (2) MATUZAWA, Takeo, "An Example of Surface Reflexion of Plane Elastic Waves," 125-139, 5 fig.
  - (3) IWANISI, Tadakazu, "Land-creep in the Western Parts of Kii Province," 163-166.
  - (4) KAWASE, Ziro, "Fissures Caused by a Land-slide on the Bank of the River Yamotogawa," 220-226, 3 fig.
  - (5) FUKUTOMI, Takaharu, "A Graphical Method of Determining the Position of Seismic Origin by Means of Times of Earthquake Commencement at Five Stations," 277-242, 8 fig.
  - (6) KAWASUMI, Hiroshi, and SUZUKI, Takeo, "Reflexion and Refraction of Seismic Waves at Discontinuity Interfaces," 277-307, 7 fig.
  - (7) MUSYA, Kinkiti, "Earthquake and Abnormal Behaviours of Fish," 349-363.
  - (8) HAGIWARA, Takahiro, and YOSIDA, Yukio, "Measurement of Viscosity of Oil Used for Damper," 374-381, 4 pl.
  - (9) HAYENO, Seizo, MIKAWA, Ituro, HAGIWARA, Takahiro, and YOSIYAMA, Ryoiti, "Seismic Prospecting of the Layers Underlying Tamagawa Bridge," 465-473, 3 fig., 1 pl.
  - (10) FUKUTOMI, Takaharu, and HAGIWARA, Takahiro, "Propagation of Sound Generated by an Explosion of a Gunpowder Mill on April 19, 1932," 528-547.
  - (11) HOSINO, Itiro, "Earth Tremors on Road Caused by Running Motor-cars," 737-745.
3067. DLOUHY, Francis N., "Earthquake Design," *Eng. N.-R.*, Vol. 116, No. 18, 640-641, New York, Apr. 30, 1936.

The above reference indicates a letter to the editor in which the writer takes exception to a note with the same title, published by J. J. Creskoff in the *Engineering News Record* for Feb. 15, 1936, and reported as No. 2954 (2) of these lists.

— DOXSEE, W. W., "A Special Recorder and Its Adaptation for Use with Milne-Shaw Seismographs" (abstract). See No. 3050 (1) of this list.

3068. EARTHQUAKE RESEARCH INSTITUTE, "Obituary of the late Prof. Torahiko Terada, member of the staff of the Earthquake Research Institute," *Bul. Eq. Res. Inst.*, Vol. 14, Part 1, i-ii, portrait, Tokyo, Mar., 1936.
3069. ESCHER, B. G., "Algemeene Geologie" (Fourth very enlarged edition), N. V. Wereldbibliotheek, 525 pp. Price 6.25 guilden. Amsterdam, 1934.

Chapter XII (349-373, fig. 251-265) deals with Seismology. The author discusses: Scales of earthquakes, Microseisms, Principles and purpose of seismographs, Seismograms, Physics of the earth. For reference to an earlier edition of this book see No. 1223 of these lists.

J.F.S.



— EWING, Maurice, CRABY, A. P., and PEOPLES, J. W., "Seismic Tests on Anthracite." See No. 3124 (1) of this list.

3070. FORD, C. Reginald, "Earthquake Resisting Design," *Jour. Roy. Inst. Brit. Arch.*, p. 882, bib., London, 1935. E.T.

3071. FUKUTOMI, Takaharu,

(1) "On the Result of Precise Levellings in the Strongly Shaken Area of the Siduoka Earthquake of July 11, 1935," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 1010-1018, 7 fig., 4 tab., Tokyo, Dec., 1935.

(2) "Heights of Tunamis at Simoda in Southern Idu Peninsula," *Ibid.*, Vol. 14, Part 1, 68-74, 5 fig., Mar., 1936.

In each case the paper is in Japanese with a short abstract in English.

— FUKUTOMI, Takaharu, "A Graphical Method of Determining the Position of Seismic Origin by Means of Times of Earthquake Commencement at Five Stations." See No. 3066 (5) of this list.

— FUKUTOMI, Takaharu, and HAGIWARA, Takahiro, "Propagation of Sound Generated by an Explosion of a Gunpowder Mill on April 19, 1932." See No. 3066 (10) of this list.

— GEBHARDT, R. E., and WENNER, F., "Adjustment of the Damping of the Galitzin Seismometer and Galvanometer" (abstract). See No. 3050 (1) of this list.

3072. GEODETIC SURVEY OF INDIA. The following papers of interest to seismologists are listed in the *Geodetic Report 1934* of the Geodetic Survey of India (reported as No. 2953 of these lists). The author, in each case, is an official of the Survey.

(1) BURREARD, S. G., "On the Origin of the Himalaya Mountains," *Professional Papers, Geodetic Survey of India*, No. 12. Price Re. 1. Calcutta, 1912.

(2) CROSTHWAIT, H. L., "Investigation of the Theory of Isostasy in India," *Ibid.*, No. 13. Out of print. Dehra Dun, 1912.

(3) HUNTER, J. de Graaff, "The Earth's Axes and Triangulation," *Ibid.*, No. 16. Price Rs. 4. Dehra Dun, 1918.

(4) BURREARD, S. G., "Investigations of Isostasy in Himalayan and Neighbouring Regions," *Ibid.*, No. 17. Price Re. 1. Dehra Dun, 1918.

(5) COWIE, H. McC., "A Criticism of Mr. R. D. Oldham's Memoir, 'The Structure of the Himalayas and of the Gangetic Plain,'" *Ibid.*, No. 18. Price Rs. 1-8. Dehra Dun, 1912.

(6) HUNTER, J. de Graaff, "Isostasy in India," *Empire Survey Review*, Vol. 2, Jan., 1933. May be obtained from the Crown Agents for the Colonies, 4 Millbank, London, S.W.1.

(7) GLENNIE, E. A., "Crustal Warpings (Discussing the Gravity Work of the Survey of India)," *The Observatory*, Jan. and Apr., 1933.

— GIBBS, Zack E., "Radio Time-Signal Recording Apparatus" (abstract). See No. 3050 (1) of this list.

- GLENNIE, E. A., "Crustal Warpings (Discussing the Gravity Work of the Survey of India)." See No. 3072 (7) of this list.
- GREEN, William G., "Method of Determining Slope of Subsurface Rock Beds" (Patent). See No. 3109 (14) of this list.
3073. GUTENBERG, B., "Velocities of Elastic Waves in Rocks of Various Ages and at Various Depths" (abstract), *Bul. Amer. Ass. Pet. Geol.*, Vol. 19, No. 12, p. 1842, 1935.
- Paper presented at the meeting on November 7-8, 1935, of the Pacific Section of the American Association of Petroleum Geologists. B.G.
3074. GUTENBERG, B., and RICHTER, C. F., "Magnitude and Energy of Earthquakes," *Science*, No. 2147, Vol. 83, 183-185, New York, Feb. 21, 1936.
3075. GUTENBERG, B., and RICHTER, C. F., "On Seismic Waves" (Third paper), *Ger. Bei.*, Bd. 47, Heft 1-2, 73-131, 6 fig., 24 tab., bib., Leipzig, 1936.
- This, the third paper on the same subject and by the same authors, deals with surface waves.
- HADDOCK, M. H., and WILSON, C. J., "The Wandering of the Continents." See No. 3132 of this list.
3076. HAGIWARA, Takahiro,
- (1) "The Air Damper," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 783-789, 4 fig., Tokyo, Dec., 1935.
  - (2) "The Sizuoka Earthquake of July 11, 1935," *Ibid.*, 951-965, 20 fig.
- The first paper is in English, the second is in Japanese with a short abstract in English. The illustrations of the second paper are excellent.
- HAGIWARA, Takahiro, and FUKUTOMI, Takaharu, "Propagation of Sound Generated by an Explosion of a Gunpowder Mill on April 19, 1932." See No. 3066 (10) of this list.
- HAGIWARA, Takahiro, and YOSIDA, Yukio, "Measurement of Viscosity of Oil Used for Damper." See No. 3066 (8) of this list.
- HAGIWARA, Takahiro, YOSIYAMA, Ryoiti, HAYENO, Seizo, and MIKAWA, Ituro, "Seismic Prospecting of the Layers Underlying Tamagawa Bridge." See No. 3066 (9) of this list.
- HATCH, Frances, "Index to Geophysical Abstracts, Nos. 69-80." Issued as pp. 1699-1736 of *Geophysical Abstracts*. See No. 3094 of this list.
- HAYENO, Seizo, MIKAWA, Ituro, HAGIWARA, Takahiro, and YOSIYAMA, Ryoiti, "Seismic Prospecting of the Layers Underlying Tamagawa Bridge." See No. 3066 (9) of this list.

## 3077. HECK, N. H.,

- (1) "A Review of Outstanding Problems in Strong-motion Vibration Work," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 343-347, Berkeley, Oct., 1935.
- (2) "Difficulties Encountered in Prediction of Earthquakes," *Sc. N.-L.*, No. 762, Vol. 28, p. 316, 1 fig., Washington, Nov. 16, 1935.

— HECK, N. H., "Status of Seismology in North America—Special Report of the U.S. Coast and Geodetic Survey" and "Ishimoto's Proposal for Listing Additional Information from the Seismograms—a Symposium" (abstracts). See No. 3050 (1) of this list.

3078. HELLAND, C. A., "Exploring with Explosives," *Exp. Eng.*, Vol. 13, No. 12, 359-371, 379, 18 fig., Wilmington, 1935. R.R.B.

An abstract by W. Ayvazoglou appears as No. 3021, pp. 1746-1747, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.

— HELLAND, C. A., "Confirmation of Reflection Work in Canada by Drilling." See No. 3124 (2) of this list.

— HENDERSON, J. P., "Continuous Wireless Time-signals" (abstract). See No. 3050 (1) of this list.

3079. HERRMANN, H., STÖCKE, K., and UDLUFT, H., "Ground Pressure and Plate-statics Tests on the Elastic Properties of Coal-measure Rocks from Upper-Silesian Mines," *Bei. Angew. Geoph.*, Bd. 5, Heft 4, 396-424, 20 fig., bib., Leipzig, 1936.3080. HILLER, W., "Die Erdbeben am Untersee (Bodensee) vom 31. Januar 1935," *Jahresberichte und Mitteilungen des Oberrheinischen Geologischer Vereins*, Bd. 25, 81-92, 1 map, Heidelberg, 1936.

The paper defines the position of the epicentre and depth of focus. The focal time is determined. The mechanism of the earthquake is deduced from the distribution of compression and rarefaction in the readings for  $P$  and  $P^*$ . W.H.

## 3081. HODGSON, Ernest A.,

- (1) "Preliminary Report of the Earthquake of November 1, 1935." Mimeographed, 9 pp. Distributed by the Dominion Observatory, Ottawa, Dec., 1935.
- (2) "Preliminary Report of the Earthquake of November 1, 1935." Abbreviated from above report. *Earthquake Notes*, Vol. 7, No. 4, 1-4, Washington, Mar., 1936.
- (3) "The Timiskaming Earthquake of November 1, 1935. The Location of the Epicentre and Determination of Focal Depth," *J.R.A.S.C.*, Vol. 30, No. 4, 113-123, 9 fig., bib., Toronto, Apr., 1936.

— HODGSON, Ernest A., "The Precision of the Seismological Evidence as to the Structure of the Deep Interior of the Earth" and "Status of Seismology—Dominion of Canada" (abstracts). See No. 3050 (1) of this list.

3082. HOLLISTER, John C., "Some Notes on Reflection Seismology," *Engineer's Bulletin*, Vol. 19, No. 3, pp. 4 and 30, Denver, 1935. F.W.L.

- HOSINO, Itiro, "Earth Tremors on Road Caused by Running Motor-cars." See No. 3066 (11) of this list.
- HUNTER, J. de Graaff, "The Earth's Axes and Triangulation" and "Isostasy in India." See Nos. 3072 (3) and (6) of this list.
3083. IMAMURA, Akitune, "On Land Deformations Accompanied by the Nosiro Earthquakes of 1694 and 1704," *Proc. Imp. Acad.*, Vol. 12, No. 1, 7-9, 2 fig., Tokyo, 1936. A.I.
3084. INGALLS, Albert G., "Amateur Seismology: Half Amateur, half Professional, Listing the Difficulties," *Sc. Amer.*, Vol. 154, No. 4, 194-195, 2 fig., New York, Apr., 1936.  
A report of the work of Mrs. Seeburger of Des Moines. A.G.I.+F.D.H.
3085. INOUE, Win, "Some Experiments on the Waves Generated by the Rotation of Some Eccentric Masses," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 757-762, 8 fig., bib., Tokyo, Dec., 1935.  
The paper is in Japanese with a short abstract in English.
3086. INUI, Teturo, "On Deformation, Wave Patterns, and Resonance Phenomenon of Water Surface due to a Moving Disturbance" (Parts I and II), *Proc. Phys.-Math. Soc. Jap.*, Third Series, Vol. 18, No. 2, 60-98, 99-113, 18 fig., bib., Tokyo, Feb., 1936.
- IWANISI, Tadakazu, "Land-creep in the Western Parts of Kii Province." See No. 3066 (3) of this list.
- JOHNSON, Earle W., "Seismic Surveying" (Patent). See No. 3109 (16) of this list.
3087. JONES, J. H., "A Seismic Method of Mapping Anticlinal Structures," *Proc. World Pet. Cong. (Geoph. Sec.)*, 169 pp., 1933. See also No. 2063 of these lists. E.T.  
The *Proceedings* are edited by A. E. Dunstan and George Sell, Aldine House, Bedford Street, London, W.C. 2. The Geological and Production Series are contained in Vol. 1. For further details see Item 2059, pp. 1220-1221, of *Geophysical Abstracts*, No. 64, reported as No. 2428 of these lists. F.W.L.
3088. JONES, O. T., *et al.*, "Development of Fractures in the Earth's Crust," *Quar. Jour. Geol. Soc.*, vi-xi, London, 1933. E.T.
- KANAI, K., and SEZAWA, K.,
- (1) "The  $M_2$  Seismic Waves."
  - (2) "Growth and Decay of Seiches in an Epicontinental Sea."
  - (3) "The Rate of Damping in Seismic Vibrations of a Surface Layer of Varying Density or Elasticity."
  - (4) "Decay in the Seismic Vibrations of a Simple or Tall Structure by Dissipation of Their Energy into the Ground."
  - (5) "Energy Dissipation in Seismic Vibrations of a Framed Structure."
  - (6) "The Nature of Microseisms of Local Type."



- (7) "The Effect of Sharpness of Discontinuities on the Transmission and Reflection of Elastic Waves."
- (8) "Energy Dissipation in Seismic Vibrations of Actual Buildings."
- (9) "Damped Free Oscillation and Amplitudes in Resonance, with Special Reference to Decay of Seiches in Straits."
- (10) "Elastic Waves Formed by Local Stress Changes of Different Rapidities."
- (11) "Energy Dissipation in Seismic Vibrations of Actual Buildings of Unlike Structure."
- (12) "Energy Dissipation in Seismic Vibrations of a Six-storied Structure. Coincidence of Resonance and Corresonance."

See No. 3122 of this list.

— KAWASE, Ziro, "Fissures Caused by a Land-slide on the Bank of the River Yamotogawa." See No. 3066 (4) of this list.

— KAWASUMI, Hiroshi, and SUZUKI, Takeo, "Reflexion and Refraction of Seismic Waves at Discontinuity Interfaces." See No. 3066 (6) of this list.

3089. KELLY, Sherwin F., "Exploring Down," *Exp. Eng.*, Vol. 13, Nos. 9 and 10, 303-312, Wilmington, 1935.

An abstract by W. Ayvazoglou appears as No. 2918, p. 1653, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.

3090. KINBARA, T., and TAKEMURA, T., "Reports on the Siduoka Earthquake of July 11, 1935," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 966-984, 6 fig., Tokyo, Dec., 1935.

The paper is in Japanese with a short abstract in English.

— KING, Louis V., "A Portable Hot-wire Seismometer" (abstract). See No. 3050 (1) of this list.

— KISHINOUE, Fuyuhiko, "The Direction of the First Motion of an Earthquake in the Kwanto District." See No. 3066 (1) of this list.

— KITHIL, Karl Ludwig, "Seismo-vibrometer," and "Seismo-vibrometer" (Patents). See Nos. 3109 (4) and (5) of this list.

— KLIPSCH, Paul W., "Performance of Oscillograph Amplifiers to Transmit Shock Excitation." See No. 3124 (3) of this list.

3091. KORIDALIN, E. A., and MASARSKY, S. J., "Application of Seismic Reflection Method to Geological Prospecting in the Region of Ishimbaev" (in Russian), *Neftianoe Khozaiatvo*, Vol. 28, No. 8, 27-30, Moscow, 1935. F.W.L.

3092. KRAHMANN, R., "Geophysical Investigations upon Mineral Deposits in Southern Africa" (Continuation until 1934), *Bei. Angew. Geoph.*, Bd. 5, Heft 4, 425-450, bib., Leipzig, 1936.

The paper compiles all the information in the possession of the writer with regard to geophysical investigations upon mineral deposits in South Africa up to the end of June, 1934. This is a continuation of a previously published list (to the end of June, 1933), published in the same journal, Bd. 1, Heft 4, 88-116, Leipzig, 1933.

3093. KRAUS, E., "Die Bewegung des Erdbebens am 8. Oktober 1930 in suddeutschen Bau," *Bericht des Naturwissenschaftlichen Vereins für Schwaben und Neuburg*, Vol. 50, 93 pp., 4 fig., 3 tab., Augsburg, 1933.

The earthquake belongs in the series which is connected with mountain-building tendencies in the Alps. R.Z.

3094. LEE, Frederick W., "Geophysical Abstracts," No. 81, 1669-1697, Jan.; No. 82, 1737-1760, Feb.; No. 83, 1761-1781, Mar.

Index to Nos. 69-80, compiled by Frances Hatch, appears as pp. 1699-1736 of *Geophysical Abstracts*.

- LEE, L. Don, "Prospecting with Seismographs; Oil, Gold, Glaciers, and Local Earthquakes," "Data on Surface-layers in New England—First Report (Chairman's Address)," "Present Status of Seismology in New Zealand" (abstracts). See No. 3050 (1) of this list.

- LEICESTER, P., and BROWN, J. Coggin, "The Pyu Earthquakes of 3rd and 4th Dec., 1930, and Subsequent Burma Earthquakes up to Jan., 1932." See No. 3054 of this list.

- MAATSCHAPPIJ VOOR WETENSCHAPPELIJK AARDLAGENONDERZOEK (Netherlands), "Procédé pour faciliter la découverte de gisements à l'aide d'ondes élastiques périodiques" (Patent). See No. 3109 (17) of this list.

- MACELWANE, James B., S.J., "Progress Report of the Jesuit Seismological Association" (abstract). See No. 3050 (1) of this list.

- MACELWANE, James B., S.J., and BRADFORD, D. C., "A Preliminary Sketch of the Seismic History of Missouri" (abstract). See No. 3050 (1) of this list.

- MASARSKY, S. J., and KORIDALIN, E. A., "Application of Seismic Reflection Method to Geological Prospecting in the Region of Ishimbaev." See No. 3091 of this list.

3095. MATUO, H., "Damages to the Quay Walls of Simizu Harbour due to the Earthquake on July 11, 1935, and the Seismic Stability of the Quay Walls," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 999-1009, 9 fig., Tokyo, Dec., 1935.

3096. MATUZAWA, Takeo, "Seismometrische Untersuchungen des Erdbebens vom 2. März 1933. III. Erdbebenstätigkeit vor und nach dem Grossbeben. Allgemeines über Nachbeben," *Bul. Eq. Res. Inst.*, Vol. 14, Part 1, 38-67, 17 fig., 13 tab., bib., Tokyo, Mar., 1936.

- MATUZAWA, Takeo, "An Example of Surface Reflexion of Plane Elastic Waves." See No. 3066 (2) of this list.

- MCCOLLUM, Burton, "Method and Apparatus for Studying Geologic Contours" (Patent). See No. 3109 (8) of this list.

3097. MCKINNEY, E. G., "Seismographing for Oil," Gulf Pub. Co. (P. O. Drawer 2811, Houston, Texas), 38 pp. Price \$2. Houston, 1935. C.A.H.+F.W.L.

3098. McLEAN, R. S., and MOORE, W. W., "Computation of the Vibration Period of Steel Tank Towers," *Bul. Seis. Soc. Am.*, Vol. 26, No. 1, 63-67, 3 fig., Berkeley, Jan., 1936.

— MIKAWA, Ituro, HAGIWARA, Takahiro, YOSIYAMA, Ryoiti, and HAYENO, Seizo, "Seismic Prospecting of the Layers Underlying Tamagawa Bridge." See No. 3066 (9) of this list.

— MILLER, A. H., "Gravity Anomalies in Canada" and "Geophysical Prospecting in Canada" (abstracts). See No. 3050 (1) of this list.

3099. MILLS, Brad,

(1) "Geophysical Programs in the Gulf-coast District are Exacting Technical Operations (Parts I and II)," *Oil Weekly*, Vol. 79, No. 4, 21-28 and No. 5, 22-27, Houston, 1935.

(2) "Geophysical Operations Have Been Very Successful in San Joaquin Valley during Past Year," *Ibid.*, No. 4, 28-29.

The above papers are reported, with abstracts by W. Ayvazoglou, as Nos. 2897 (p. 1643) and 2956 (p. 1674) of *Geophysical Abstracts*. See No. 3094 of this list.

F.W.L.

— MITCHELL, Lane, and CRICKMAY, Geoffrey, W., "The Southern Appalachian Earthquake of January 1, 1935." See No. 3060 of this list.

3100. MIYABE, Naomi, "On the Sinking of the Earth's Crust in the Eastern Part of the City of Tokyo," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 763-771, 7 fig., bib., Dec., 1935.

— MOORE, W. W., and McLEAN, R. S., "Computation of the Vibration Period of Steel Tank Towers." See No. 3098 of this list.

3101. MORGAN, Charles Gill, "Thickness of Ice Shield in Antarctica is Determined by Geophysics," *Oil and Gas Jour.*, Vol. 34, No. 10, p. 43, Tulsa, 1935.

A brief abstract by W. Ayvazoglou appears as No. 2776, p. 1582, of *Geophysical Abstracts*, reported as No. 3094 of this list.

F.W.L.

— MUSCHKETOW, D., and OCZAPOWSKI, B. L., "Geologische Erwägungen zu den neuen Schweremessungen auf dem Pamir und in Karelien" und "Schweremessungen mittels Pendeln, ausgeführt auf dem Pamir und in Karelien in den Jahren 1932 und 1933." See No. 3105 of this list.

— MUSYA, Kinkiti, "Earthquake and Abnormal Behaviours of Fish." See No. 3066 (7) of this list.

3102. NASU, N., and YASUDA, C., "The Siduoka Earthquake of July 11, 1935," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 942-950, 24 fig., Tokyo, Dec., 1935.

The paper is in Japanese with a short abstract in English. The illustrations are excellent.

3103. NATURE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 137 of the above periodical (London, 1936):

- (1) "Canadian Earthquake of November 1, 1935," No. 3466, p. 585, Apr. 4.
- (2) "Eureka (California) Earthquake of June 6, 1932," No. 3472, p. 833, May 16, 1936.

— NEUMANN, Frank, "Some New Data on Long-period Waves in Epicentral Areas" (abstract). See No. 3050 (1) of this list.

3104. NOMITSU, Takaharu,

- (1) "A Theory of Tunamis and Seiches Produced by Wind and Parametric Gradient," *Mem. Col. Sc., Kyoto Imp. Univ., Ser. A, Vol. 18, 201-214, Kyoto, 1935.*
- (2) "Surface Fluctuations of Lake Biwa Caused by Muroto Typhoon," *Ibid.*, 221-238, 9 fig.

An abstract of each of the above papers appears on pp. 10 and 11 of the abstracts section of *Jap. Jour. Ast. Geoph.*, Vol. 13, No. 2, Tokyo, 1936.

— NOVOTORCEV (NOVOTORZEV), V. I., "Method of Successive Approximations Applied to the Study of Vibrations of Structures. The Effect of Shearing Force, Rotatory Inertia, and Longitudinal Vibrations of Rigid Bents" (in Russian). See No. 3042 (2) of this list.

3105. OCZAPOWSKI, B. L., and MUSCHKETOW, D., "Schweremessungen mittels Pendeln, ausgeführt auf dem Pamir und in Karelien in den Jahren 1932 und 1933" und "Geologische Erwägungen zu den neuen Schweremessungen auf dem Pamir und in Karelien," *Bei. Angew. Geoph.*, Bd. 5, Heft 4, 451-479, 7 fig., 2 tab., bib., Leipzig, 1936.

The two papers are by the respective authors in the order named.

3106. ODERMATT, H., "Tremblement de terre du Japon du 2 mars 1933," *Bul. Soc. Neuchâteloise des Sci. Natur.*, Vol. 58, 127-128, Neuchâtel, 1933. R.Z.

— O'DONNELL, George A., S.J., "A New Vector Wave Motion Theory" (abstract). See No. 3050 (1) of this list.

3107. OIL AND GAS JOURNAL, "Consistent Gain in Use of Geophysical Methods Shown in California Fields," *Oil and Gas Jour.*, Vol. 34, No. 25, 158-162, Tulsa, 1935.

An abstract by W. Ayvazoglou appears as No. 2960, p. 1677, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.

— OWEN, John E., "Method for Surveying Subsurface Formations" and "Seismic Surveying" (Patents). See Nos. 3109 (9) and (13) of this list.

3108. OXFORD UNIVERSITY, "The International Seismological Summary, 1931, January, February, March," 1-164, Oxford, 1935.



3109. PATENTS. The following are patents of interest to seismologists which have been reported recently in *Geophysical Abstracts* (Nos. 77-83), reported as No. 3094 of this list. The three numbers in the bracket in each case refer, respectively, to the item, the page, and the issue number of *Geophysical Abstracts*.

- (1) VOIUTSKY, V. S., "Method of Measuring the Velocity of Propagation of Elastic Waves in Solid Mediums," Russian Patent 40,597. (2748, 1568, 77).
- (2) VOIUTSKY, V. S., "Apparatus for Seismic Prospecting," Russian Patent 42,640. (2751, 1569, 77).
- (3) ANDERSON, John A., "Seismometer," U.S. Patent 1,552,186. (2812, 1598, 78).
- (4) KITHIL, Karl Ludwig, "Seismo-vibrometer," U.S. Patent 1,669,135. (2813, 1598, 78).
- (5) KITHIL, Karl Ludwig, "Seismo-vibrometer," U.S. Patent 1,672,892. (2814, 1599, 78).
- (6) TURNER, Edwin E., "Distance and Depth Finding," U.S. Patent 2,009,459. (2815, 1599, 78).
- (7) TURNER, Edwin E., "Means for Measuring Depths or Distances," U.S. Patent 2,009,460. (2816, 1599, 78).
- (8) McCOLLUM, Burton, "Method and Apparatus for Studying Geologic Contours," U.S. Patent 1,675,121. (2876, 1630, 79).
- (9) OWEN, John E., "Method for Surveying Subsurface Formations," U.S. Patent 1,959,004. (2885, 1633, 79).
- (10) WILLIAMS, Robert Longfellow, "Method and Apparatus for Measuring Distances and Depths," U.S. Patent 2,015,702. (2925, 1658, 80).
- (11) YURIN, G. S., "Seismograph," Russian Patent 26,812. (2928, 1659, 80).
- (12) BLAU, Ludwig W., SLOTNICK, MORRIS M., and STATHAM, Louis, "Compound Seismograph," U.S. Patent 2,018,756. (2984, 1690, 81).
- (13) OWEN, John E., "Seismic Surveying," U.S. Patent 2,018,737. (2985, 1690, 80).
- (14) GREEN, William G., "Method of Determining Slope of Subsurface Rock Beds," U.S. Patent 2,024,921. (3040, 1756, 82).
- (15) SOCIÉTÉ DE PROSPECTION ÉLECTRIQUE (Procédés Schlumberger), "Procédé et appareillage pour la reconnaissance des terrains traversés par un sondage," French Patent 786,863. (3046, 1758, 82).
- (16) JOHNSON, Earle W., "Seismic Surveying," U.S. Patent 2,028,286. (3085, 1778, 83).
- (17) MAATSCHAPPIJ VOOR WETENSCHAPPELIJK AARDLAGENONDERZOEK (Netherlands). "Procédé pour faciliter la découverte de gisements à l'aide d'ondes élastiques périodiques," French Patent 565,689. (2992, 1692, 81).

— PEOPLES, J. W., EWING, Maurice, and CRARY, A. P., "Seismic Tests on Anthracite." See No. 3124 (1) of this list.

3110. PREY, A., "Über die Elastizitätskonstante der Erde," *Ger. Bei.*, Vol. 44, No. 1, 59-80, Leipzig, 1935.

This is the second paper by the same author on the same subject. The first was reported as No. 570 of these lists.

3111. REVUE PÉTROLIFÈRE. The issue of *La Revue Pétrolifère* (Paris), for Dec. 7, 1935 (No. 660), is devoted almost entirely to geophysics. Articles outline the history and present state of geophysical prospecting in various parts of the world. An outline of the table of contents is given as Item 3037, p. 1755, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.

- RICHTER, C. F., and GUTENBERG, B., "Magnitude and Energy of Earthquakes." See No. 3074 of this list.
- RICHTER, C. F., and GUTENBERG, B., "On Seismic Waves." See No. 3075 of this list.
- ROSAIRE, E. E., "Strategy and Tactics in Geophysical Exploration for Petroleum." See No. 3124 (4) of this list.
- ROZOVA, E., "Construction of Travel-time Curves and Determination of Principal Seismic Elements for Central Asia" (in Russian with short abstract in English). See No. 3042 (4) of this list.

3112. SAITA, T., "The Shizuoka Earthquake of July 11, 1935," *Bul. Eq. Res. Inst.*, Vol. 13, Part 4, 985-998, 24 fig., 8 tab., Tokyo, Dec., 1935.

The paper is in Japanese with an abstract in English. The illustrations are excellent.

3113. SAITA, T., and SUZUKI, M., "Vibration of a Tall Building Caused by Earthquake Shocks," *Bul. Eq. Res. Inst.*, Vol. 14, Part 1, 104-118, 15 fig., Tokyo, Mar., 1936.

The paper is in Japanese with an abstract in English.

3114. SASSA, Kenzo,

(1) "Volcanic Micro-tremors and Eruption-earthquakes," *Mem. Col. Sc., Kyoto Imp. Univ.*, Series A, Vol. 18, No. 5, 255-293, 28 fig., 11 tab., bib., Kyoto, 1935.

(2) "Micro-seismometric Study on Eruptions of the Volcano Aso," *Ibid.*, Vol. 19, No. 1, 11-56, 27 fig., 3 pl., 4 tab., bib., 1936.

The above papers are respectively Parts I and II of the *Geophysical Studies on the Volcano Aso*.  
K. Sassa.

3115. SAWYER, Edmund O., Jr., "Geophysical Survey by Seismic Reflection," *Pet. World (Annual Review)*, 197-208, Los Angeles, 1935.

A review by W. Ayvazoglou appears as No. 3008, p. 1741, of *Geophysical Abstracts*, reported as No. 3094 of this list.  
F.W.L.

- SCHERMANN, D., "Quelques cas spéciaux du problème de la théorie d'élasticité à simmetrie axiale" (in Russian with short abstract in French). See No. 3042 (3) of this list.

3116. SCHLÖTZER, A., "Bericht über die Erdbebenwarte des Naturwissenschaftlichen Vereins im Geodätischen Institut der Technische Hochschule, Karlsruhe," *Verhand. Naturwissen. Ver., Karlsruhe*, Vol. 31, 17-19, 1935.

Report for the years 1926-1935.

R.Z.

3117. SCIENCE NEWS-LETTER. Brief notes of interest to seismologists have appeared in Vol 28 (1935) of *Science News-Letter* (Washington) as follows:

(1) "Central Alaska Shaken by Moderate Earthquake," No. 754, p. 183, Sept. 21.

(2) "Earthquake Predictions Should Specify the Place," *Ibid.*, p. 184.

(3) "Deep Earthquakes Show Flaws 62 to 180 Miles Below Crust," *Ibid.*, p. 188.

- (4) "Center of Earthquake was near to Northern Japan," *Ibid.*, p. 190.
- (5) "Earthquake near Equator in New Guinea Region," No. 755, p. 201, Sept. 28.
- (6) "Quake Shakes Sea Bottom off British Columbia," No. 756, p. 221, Oct. 5.
- (7) "Second Earthquake in Month in North Japanese Region," No. 757, p. 237, Oct. 12.
- (8) "West Indian Earthquake Had Submarine Epicenter," No. 763, p. 329, Nov. 23.
- (9) "New Pressures Make Ice Hotter than Boiling Water," No. 765, 355-356, 1 fig., Dec. 7.
- (10) "Quake under Pacific 400 Miles off Ecuador," *Ibid.*, p. 361.
- (11) "Panama Earthquake Was Centered under Caribbean," No. 766, p. 377, Dec. 14.
- (12) "Earthquakes in Pacific and South America," No. 768, p. 404, Dec. 28.

3118. SCIENCE NEWS-LETTER. Brief notes of interest to seismologists appear in Vol. 29 (1936) of *Science News-Letter* (Washington) as follows:

- (1) "Earthquake Reproduced with 'Electric Eye'," No. 769, 3-4, 1 fig., Jan. 4.
- (2) "Earthquake Rocks the Dutch East Indies," No. 771, p. 40, Jan. 18.
- (3) "Deep-seated Earthquake in Northern Argentina," No. 772, p. 55, Jan. 25.
- (4) "North America being Pulled into Pacific Ocean," No. 773, p. 76, Feb. 1.
- (5) "Quake-resisting Strength for Buildings Shown," No. 778, p. 153, Mar. 7.
- (6) "Great Lakes Harbors Growing Deeper Due to Tilt," No. 780, p. 181, Mar. 21.
- (7) "Greatest Hazard from Meteorite Would be Hot Air," No. 783, p. 228, Apr. 11.
- (8) "Severe Earthquake in Celebes Sea," *Ibid.*, p. 231.

3119. SEISMOLOGICAL SOCIETY OF AMERICA. A meeting of the Seismological Society of America was held at Stanford, Cal., April 12-13, 1935. A meeting of the Eastern Section of the Society was held at Ottawa, May 27-28, 1935. The papers presented at each of these meetings are listed (by title and author only) on pages 279 and 281, respectively, of the *Bulletin of the Seismological Society of America*, Vol. 25, No. 3, July, 1935.

3120. SEISMOS GEOPHYSICAL COMPANY, "Recent Geophysical Abstracts." Published by the Seismos Geophysical Company, Hanover, Germany; 49 pp., illus., 1935.

In addition to describing other geophysical apparatus manufactured by the company, the first two sections are devoted to a description of the instruments and methods for prospecting by the seismic method, both refraction and reflection equipment and practice being dealt with. SGC.

3121. SEZAWA, K.,

- (1) "Vibrational Causes of the Overturning of Railway Carriages on the Setagawa Bridge in the Typhoon of Sept. 21, 1934," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 715-721, 3 fig., bib., Tokyo, Sept., 1935.
- (2) "Elastic Waves Produced by Applying Statical Force to a Body or by Releasing it from a Body," *Ibid.*, Part 4, 740-749, bib., Dec., 1935.

3122. SEZAWA, K., and KANAI, K.,

- (1) "The  $M_2$  Seismic Waves," *Bul. Eq. Res. Inst.*, Vol. 13, Part 3, 471-475, 5 fig., 1 tab., bib., Tokyo, Sept., 1935.
- (2) "Growth and Decay of Seiches in an Epicontinental Sea," *Ibid.*, 476-483, 1 fig., bib.
- (3) "The Rate of Damping in Seismic Vibrations of a Surface Layer of Varying Density or Elasticity," *Ibid.*, 484-495, 9 fig., bib.

- (4) "Decay in the Seismic Vibrations of a Simple or Tall Structure by Dissipation of Their Energy into the Ground," *Ibid.*, 681-697, 24 fig., bib.
- (5) "Energy Dissipation in Seismic Vibrations of a Framed Structure," *Ibid.*, 698-714, 12 fig., bib.
- (6) "The Nature of Microseisms of Local Type," *Ibid.*, Part 4, 729-739, 10 fig., bib., Dec., 1935.
- (7) "The Effect of Sharpness of Discontinuities on the Transmission and Reflection of Elastic Waves," *Ibid.*, 750-756, 8 fig.
- (8) "Energy Dissipation in Seismic Vibrations of Actual Buildings," *Ibid.*, 925-941, 9 fig., 3 tab., bib.
- (9) "Damped Free Oscillation and Amplitudes in Resonance, with Special Reference to Decay of Seiches in Straits," *Ibid.*, Vol. 14, Part 1, 1-9, 9 fig., 2 tab., bib., Mar., 1936.
- (10) "Elastic Waves Formed by Local Stress Changes of Different Rapidities," *Ibid.*, 10-17, 4 fig.
- (11) "Energy Dissipation in Seismic Vibrations of Actual Buildings of Unlike Structure," *Ibid.*, 119-133, 9 fig., 7 tab., bib.
- (12) "Energy Dissipation in Seismic Vibrations of a Six-storied Structure. Coincidence of Resonance and Corresonance," *Ibid.*, 134-145, 3 fig., 1 tab., bib. K.S.

3123. SHARPE, J. A., "Motion of the Surface of the Earth in the Compressional Phase of a Deep-focus Earthquake, and the Effects of a Layered Crust," *Bul. Seis. Soc. Am.*, Vol. 25, No. 3, 199-222, 10 fig., 4 tab., bib., Berkeley, July, 1935. J.A.S.

For abstract of above paper see *Earthquake Notes*, reported as No. 3050 (1) of this list.

- SLOTNICK, MORRIS M., STATHAM, LOUIS, and BLAU, Ludwig, W., "Compound Seismograph" (Patent). See No. 3109 (12) of this list.

- SOCIÉTÉ DE PROSPECTION ÉLECTRIQUE (Procédés Schlumberger), "Procédé et appareillage pour la reconnaissance des terrains traversés par un sondage" (Patent). See No. 3109 (15) of this list.

3124. SOCIETY OF PETROLEUM GEOPHYSICISTS. The sixth annual meeting of the above society was held at Wichita, Kansas, March 22, 1935. The following items indicate abstracts of papers there presented which are of interest to seismologists. The abstracts appear on pp. 1548-1549 of *Geophysical Abstracts*, reported as No. 3094 of this list.

- (1) EWING, Maurice, CRARY, A. P., and PEOPLES, J. W., "Seismic Tests on Anthracite."
- (2) HELLAND, C. A., "Confirmation of Reflection Work in Canada by Drilling."
- (3) KLIPSCH, Paul W., "Performance of Oscillograph Amplifiers to Transmit Shock Excitation."
- (4) ROSAIRE, E. E., "Strategy and Tactics in Geophysical Exploration for Petroleum."

3125. SOHON, F. W., S.J., "A First Approximation for Deep-focus Seismograms," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 311-312, 1 fig., 1 tab., Berkeley, Oct., 1935.

- SOHON, F. W., S.J., "Report on Twenty-four Weeks of Microseismic Activity" (abstract). See No. 3050 (1) of this list.



## 3126. SPARKS, Neil R.,

(1) "Building Vibrations," *Bul. Seis. Soc. Am.*, Vol. 25, No. 4, 381-386, 3 fig., Berkeley, Oct., 1935.

(2) "The Eureka Earthquake of June 6, 1932," *Ibid.*, Vol. 26, No. 1, 13-27, 5 fig., bib., tab., Jan., 1936. N.R.S.

— STATHAM, LOUIS, BLAU, Ludwig W., and SLOTNICK, MORRIS M., "Compound Seismograph" (Patent). See No. 3109 (12) of this list.

— STÖCKE, K., UDLUFT, H., and HERRMANN, H., "Ground Pressure and Plate-statics Tests on the Elastic Properties of Coal-measure Rocks from Upper-Silesian Mines." See No. 3079 of this list.

3127. STONELEY, R., "The Refraction of a Wave Group," *Proc. Camb. Phil. Soc.*, Vol. 31, No. 3, 360-367, Cambridge, Aug., 1935. E.T.

3128. STROMEYER, C. P., "Earth Movements," *Min. Mag.*, Vol. 49, 27-30, 91-95, London, 1933. E.T.

3129. STRUCTURAL ENGINEER, "Earthquake Resistance of Structures," *Struc. Eng.*, Dec., 1934. E.T.

— SUZUKI, M., and SAITA, T., "Vibration of a Tall Building Caused by an Earthquake." See No. 3113 of this list.

— SUZUKI, Takeo, and KAWASUMI, HIROSI, "Reflexion and Refraction of Seismic Waves at Discontinuity Interfaces." See No. 3066 (6) of this list.

— TAKEMURA, T., and KINBARA, T., "Reports on the Siduoka Earthquake of July 11, 1935." See No. 3090 of this list.

— TURNER, Edwin E., "Distance and Depth Finding" and "Means for Measuring Depths or Distances" (Patents). See Nos. 3109 (6) and (7) of this list.

— UDLUFT, H., HERRMANN, H., and STÖCKE, K., "Ground Pressure and Plate-statics Tests on the Elastic Properties of Coal-measure Rocks from Upper-Silesian Mines." See No. 3079 of this list.

— ULRICH, F. P., "California Strong-motion Program of the Coast and Geodetic Survey—a Special Report" (abstract). See No. 3050 (1) of this list.

An abstract of a paper with the title: "A Progress Report of the California Seismological Program of the Coast and Geodetic Survey," appears in *Earthquake Notes*, reported as No. 3050 (1) of this list.

3130. VAN DIJK, G., "Seismische Registreringen te Heerlen, 1 Mai 1933—30 April 1934," *Jaar. Geol. Bur. Heerlen, 1932*, 47-48, Heerlen, 1934. R.Z.

— VARDANJANC (WARDANIANZ), L., "Seismotectonics of the Caucasus" (in Russian). See No. 3042 (1) of this list.

- VOIUTSKY, V. S., "Method of Measuring the Velocity of Propagation of Elastic Waves in Solid Mediums," and "Apparatus for Seismic Prospecting" (Patents). See No. 3109 (1) and (2) of this list.
- WENNER, F., and GEBHARDT, R. E., "Adjustment of the Damping of the Galitzin Seismometer and Galvanometer" (abstract). See No. 3050 (1) of this list.
3131. WILLIAMS, Neil, "Exploration for Oil out in the Gulf is within Engineering Possibilities," *Oil and Gas Jour.*, Vol. 34, No. 8, 42-45, Tulsa, 1935.
- An abstract by W. Ayvazoglou appears as No. 2719, p. 1558, of *Geophysical Abstracts*, reported as No. 3094 of this list. F.W.L.
- WILLIAMS, Robert Longfellow, "Method and Apparatus for Measuring Distances and Depths" (Patent). See No. 3109 (10) of this list.
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- (2) "Changes in the Physical Geography of East Africa in Human Times," *Geog. Jour.*, Vol. 84, 296-305, London, 1934. E.T.

— LEE, A. W., and WHIPPLE, F. J. W., "Notes on the Theory of Microseisms." See No. 3262 of this list.

## 3199. LEE, Frederick W., "Geophysical Abstracts," No. 84, 1782-1806, Apr.; No. 85, 1807-1830, May; Washington, 1936.

## 3200. LEET, L. Don,

- (1) "The Provincetown, Massachusetts, Earthquake of April 23, 1935, and Data for Investigating New England's Seismicity," *Proc. Nat. Acad. Sc.*, Vol. 21, No. 6, 308-313, 4 fig., Washington, June, 1935. L.D.L.
- (2) "Seismological Data on Surface Layers in New England," *Bul. S.S.A.*, Vol. 26, No. 2, 129-145, 7 fig., 4 tab., bib., Berkeley, Apr., 1936.

— LEET, L. Don, "A Refraction and Reflection Fan to 187.8 km.," and "True Horizontal Displacements near a Five-ton Blast" (titles only). See No. 3240 of this list.

3201. LEHMANN, Miss I., "P", *Pub. Bur. Cent. Séis. Inter., U.G.G.I.*, Ser. A, *Trav. Scien.*, Fasc. 14, 87-115, 7 fig., 7 tab., bib., Strasbourg, 1936.

— LINTON, E. P., and COOPER, D. LeB., "A Note on the Use of Hot Wire Anemometers." See No. 3157 of this list.

— LOUDERBACK, George D., "Geological Features of Fault-line Valleys in the Central California Coast Ranges as Affecting Reservoir Sites" (abstract). See No. 3152 of this list.

3202. LÜCKENBATH, H., "Erfolgreiche Anwendung des seismischen Reflexionsverfahrens im Ruhrbergbau," *Glückauf*, Bd. 72, No. 10, 236-238, Essen, 1936.

An abstract by W. Ayvazoglou appears as No. 3155, p. 1812, of *Geophysical Abstracts*, No. 85, reported as No. 3199 of this list. F.W.L.

3203. LYNCH, J. Joseph, S.J., "Modern Seismology and Some of Its Problems," *R.S.I.*, Vol. 7, No. 6, 229-232, 5 fig., Lancaster, June, 1936.

— MACCLINTOCK, Paul, and HESS, H. H., "Submerged Valleys on Continental Slopes and Changes of Sea Level." See No. 3180 of this list.

## 3204. MACELWANE, James B., S.J., "Progress Report of the Jesuit Seismological Association." Mimeographed report, 3 pp., 1935.

Presented at the meeting of the Eastern Section of the Seismological Society of America, Ottawa, May 27, 1935.



— MACELWANE, James B., S.J., "Absolute and Relative Energy Relations in Reflection and Refraction of Elastic Waves" (title only). See No. 3240 of this list.

3205. MARTIN, H.,

- (1) "Einschwingvorgänge," *Phys. Zeit.*, Jahr. 37, 166-167, 4 fig., Leipzig, 1936.
- (2) "Einschwingvorgänge und ihre Bedeutung bei der Aufzeichnung von stossähnlichen Erschütterungen," *Veroff.*, Jena, Heft 26, 1-40, 48 fig., bib., Leipzig, 1935.

The bibliography given in the paper mentioned last above is important, presenting the data of 31 papers on the subject of artificial vibrations and their study by means of seismographs.

3206. MATUYAMA, Motonori, "Distribution of Gravity over the Nippon Trench and Related Areas," *Proc. Imp. Acad.*, Vol. 12, No. 4, 93-95, 1 map, Tokyo, Apr., 1936.

— McDERMOTT, E., "Regional Geophysical Activities for 1935" (California). See No. 3172 of this list.

3207. MIHAILOVIC, Jelenko, "Die Erdbebenkatastrophen in Albanien," *Ger. Bei.*, Bd. 47, Heft 3, 252-266, 1 fig., 1 tab., bib., Leipzig, 1936.

3208. MINES DEPARTMENT, GREAT BRITAIN, "Twelfth Annual Report of the Safety in Mines Research Board, 1933," London, 1934.

The report deals, in part, with the physical properties of rocks. E.T.

3209. MIYABE, Naomi, "Some Phenomena Associated with the Kawati-Yamato Earthquake of February 21, 1936," *Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 297-306, 7 fig., Tokyo, June, 1936.

The paper is in Japanese with a short abstract in English.

— MIYABE, N., and TERADA, T., "Crustal Deformation along the Line of Levels from Miyako to Aomori." See No. 3249 of this list.

3210. MOORE, G. E., "Miniature Synchronous Motors in Service," *Horological Jour.*, No. 933, Vol. 78, 3-4, London, June, 1936.

— MORGAN, C. C., "Geophysical Studies in Antarctica" (title only). See No. 3240 of this list.

— MURPHY, Paul R., "The Diagnostic Value of Fault and Vein Intersections in Determining Regional Deformation" (abstract). See No. 3152 of this list.

3211. NASU, Nobuji, and HAGIWARA, Takahiro,

- (1) "The Kawati-Yamato Earthquake of February 21st, 1936," *Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 285-289, 1 fig., 2 tab., Tokyo, June, 1936.
- (2) "Determination of the Proper Periods of the Ground in Osaka," *Ibid.*, 290-296, 5 fig.

Each of these papers is in Japanese with a short abstract in English.

3212. NATURE. The following items of interest to seismologists have appeared recently in Vol. 137 of the above periodical (London, 1936):
- (1) "Destructive Earthquakes of 1935," No. 3475, p. 955, June 6. F.D.H.
  - (2) "Locating Underground Rock by Sound Waves," *Ibid.*
  - (3) "Crustal Deformations in Japan," No. 3476, p. 1000, June 13.
3213. NATURE. The following items of interest to seismologists have appeared recently in Vol. 138 of the above periodical (London, 1936):
- (1) "Earthquake Records at De Bilt, Holland," No. 3481, p. 109, July 18.
  - (2) "The Japanese Earthquake of February 21, 1936," No. 3482, p. 171, July 25.
  - (3) "Lunar Periodicity of Earthquakes," No. 3483, p. 209, Aug. 1.
3214. OAKSHOTT, S. J., "The Indian Earthquake," *Quar. J.R. Met. Soc.*, Vol. 60, 185-186, London, 1934. E.T.
3215. OGAWA, Takuji, "On a Seismogenic Line in Kin-ki Provinces, Southwest Japan: Part I, Great Earthquake of Northern Districts of Tango, 1926," *Proc. Imp. Acad.*, Vol. 12, No. 4, 96-98, 1 map, bib., Tokyo, Apr., 1936.
3216. OXFORD, UNIVERSITY OBSERVATORY, "The International Seismological Summary, 1931, April, May, June," 165-283, Oxford, 1936.
3217. PASCOE, Sir Edwin H., "Indian Earthquakes, Their Causes and Consequences," *Jour. R.S. Arts*, Vol. 82, 578-589, 1934. E.T.
3218. PASTOR, A. Rey,
- (1) "Géologie des pays Catalans." Published by L'Association pour l'Étude Géologique de la Méditerranée Occidentale, *Sismicidad de las Regiones Litorales Españolas del Mediterraneo*, Vol. 3, No. 1, Part 6, 20 pp. in reprint, 17 fig., 1 pl., Barcelona, 1935.
  - (2) "Datos sísmicos de la península Ibérica: 1<sup>er</sup> trimestre de 1935," *Ibérica*, Vol. 44, Nos. 1092-1097, 6 pp. in reprint, 3 fig., bib., Barcelona, Nov. 2-Dec. 7, 1935.
  - (3) "Datos sísmicos de la península Ibérica: 2<sup>o</sup> trimestre de 1935," *Ibid.*, Vol. 45, No. 1106, 3 pp. in reprint, 2 fig., 1 tab., bib., Feb. 8, 1936.
  - (4) "Datos sísmicos de la península Ibérica: 3<sup>er</sup> trimestre de 1935," *Ibid.*, No. 1115, 3 pp. in reprint, 2 fig., 1 tab., bib., Apr. 11, 1936. A.R.P.
3219. PATENTS. The following patents of interest to seismologists are reported in *Geophysical Abstracts* (see No. 3199 of this list). Of the three numbers in brackets following each entry below, the first indicates the serial number of the *Abstracts* in which it is reported, the second the abstract number, and the third the page of the issue reporting it.
- (1) TURNER, Edwin E., Jr., "Method and Apparatus for Measuring Depths." U.S. Patent No. 2,033,160, Mar. 10, 1936. (84, 3140, 1804.)

(2) McCOLLUM, Burton, "Seismic Method for Profiling Geologic Formations." U.S. Patent No. 2,021,943, Nov. 26, 1935. (85, 3183, 1826.)

(3) SUBMARINE SIGNAL Co., "Improvements in Apparatus for Distance and Depth Measurements." British Patent No. 434,554, Sept. 4, 1935. (85, 3187, 1827.)

— PATRICK, H. G., "Regional Geophysical Activities for 1935" (West Texas and Southeastern New Mexico). See No. 3172 of this list.

3220. PERRI, Emilio, "Considerazioni sulle vibrazioni del suolo e dei fabbricati," *Bol. Soc. Sis. Ital.*, Vol. 34, No. 1-2, 20-34, 6 fig., bib., Rome, 1936.

— PYE, W., SCHAFER, S., and UHRIG, L., "Earthquake of February 26, 1932" (abstract). See No. 3152 of this list.

— RANSONE, K., and ROSAIRE, E. E., "Regional Geophysical Activities for 1935" (Gulf Coast—Southeast Texas and South Louisiana). See No. 3172 of this list.

3221. REHM, H., "Die Erdbebentätigkeit der Weltmeere sowie ihre Beziehungen zur Tektonik," *Veröff Jena.*, Heft 27, 1-24, 3 fig., bib., Leipzig, 1936.

— RICHTER, C. F., "Earthquake Magnitudes and Statistics" (abstract). See No. 3152 of this list.

— RICHTER, C. F., and GUTENBERG, B., "Further Contribution to the Study of Deep-focus Earthquakes" (abstract). See No. 3152 of this list.

3222. RIEBER, F., "A New Reflection System with Controlled Directional Sensitivity," *Geoph.*, Vol. 1, No. 1, 97-106, 8 fig., Houston, Jan., 1936. R.R.B.

— RIEBER, F., "Controlled Directional Sensitivity; a Method for Adapting Reflection Methods to Complex Structures" (title only). See No. 3240 of this list.

3223. ROESS, Jeanne,

(1) "Mesure du coefficient de restitution des roches," *Pub. Bur. Cent. Séis. Inter., U.G.G.I.*, Ser. A., *Trav. Scien.*, Fasc. 13, 3-69, 13 fig., 2 tab., bib., Strasbourg, 1935.

(2) "Étude des ondes provenant de séismes éloignés," *Ibid.*, 71-146, 12 fig., bib.

— ROSAIRE, E. E., and RANSONE, K., "Regional Geophysical Activities for 1935" (Gulf Coast—Southeast Texas and South Louisiana). See No. 3172 of this list.

3224. ROSAIRE, E. E., and STILES, M. E., "Exploration on the Gulf Coast, to 1936," *Geoph.*, Vol. 1, No. 1, 141-148, 1 fig., 1 tab., 4 charts, Houston, Jan., 1936.

— ROTHROCK, H. E., and KNECHTEL, M. M., "Apparent Recent Crustal Movement at Western End of the Ouachita Mountains, Oklahoma." See No. 3193 of this list.

3225. SAITA, Tokitaro, "Geological and Topographical Investigation of the Earthquake Damages on the Boundary between Osaka and Nara Prefecture on the 21st of February, 1936,"  
*Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 307-317, 19 fig., Tokyo, June, 1936.  
The paper is in Japanese with a short abstract in English.
3226. SASSA, Kenzo, "Anomalous Deflection of Seismic Rays in Volcanic Districts" (Part III of the Geophysical Studies on the Volcano Aso), *Mem. Col. Sc., Kyoto Imp. Univ.*, Ser. A, Vol. 19, No. 2, 65-78, 5 fig., 4 tab., Kyoto, 1936. K. Sassa
3227. SAWTELLE, George, "Salt-dome Statistics," *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 6, 726-735, 3 tab., 1 fig., bib., Tulsa, June, 1936.
- SCHAFER, S., UHRIG, L., and PYE, W., "Earthquake of February 26, 1932" (abstract). See No. 3152 of this list.
- SCHERB, Ivan, "Earthquake of October 23, 1935, San Bernardino County, California" (abstract). See No. 3152 of this list.
3228. SCHMÜCKING, Hans, "Ein Beitrag zur Entwicklung der Präzisionspendeluhren" (Inaug. Dissert., Jena), *Uhrmacher-Woche*, Nos. 25-34, 8 pp. in reprint, 16 fig., bib., Leipzig, 1935. H.S.
- SCHUMACHER, J. P., "Regional Geophysical Activities for 1935" (South Texas). See No. 3172 of this list.
3229. SCIENCE. The following brief notes of interest to seismologists appear in Vol. 83 of the above periodical (New York, 1936):
- (1) "Joint Session of American Geophysical Union and Eastern Section, Seismological Society of America, Washington, May 1-2, 1936," No. 2151, p. 282, Mar. 20.
  - (2) "Shaking Table Experiments at Massachusetts Institute of Technology," fourth paragraph, first column, p. 510, No. 2161, May 29.
  - (3) "Solomon Islands Earthquake, May 19, 1936," *Ibid.*, p. 11 (Supp.)
  - (4) "Dr. Jaggar to Visit Montserrat," No. 2162, p. 548, June 5.
3230. SCIENCE. The following notes of interest to seismologists appear in recent issues of Vol. 84 of the above periodical (New York, 1936):
- (1) "Japanese Earthquakes," No. 2167, p. 8 (Supp.), July 10.
  - (2) "Volcanic Activity on the Island of Montserrat," No. 2168, p. 7 (Supp.), July 17.
3231. SCIENCE NEWS-LETTER. Brief articles of interest to seismologists have appeared in Vol. 29 of the above periodical (Washington) as follows:
- (1) "New Instrument Predicts Mine Roof Cave-ins," No. 786, p. 289, May 2, 1936.
  - (2) "Earthquake Shakes Honduran Seacoast," No. 787, p. 301, May 9, 1936.
  - (3) "124 Earth Tremors in 10 Days at Mt. Lassen," No. 790, p. 348, May 30, 1936.
  - (4) "Earthquakes Belong to Two Different Families," *Ibid.*, p. 348.



- (5) "Violent Earthquake Centered in Northern Part of India," No. 791, p. 363, June 6, 1936.
- (6) "Earthquake Recorded from Solomon Islands," *Ibid.*
- (7) "Earth Writes of Tragedy," *Ibid.*, 1 fig.
- (8) "Pacific Ocean Bottom Has Its Own 'Lost' Quake," *Ibid.*
- (9) "Quake off Pacific Coast of Northern California," No. 792, p. 380, June 13, 1936.
- (10) "Used Plane to Hunt Quake Located by Seismograph," No. 793, p. 402, June 20, 1936.

3232. SCIENCE NEWS-LETTER. Brief articles of interest to seismologists have appeared in Vol. 30 of the above periodical (Washington) as follows:

- (1) "Three Vast Submarine Canyons Found off Atlantic Coast," No. 795, p. 6, July 4, 1936.
- (2) "Quake North of Japan Recorded by Instruments," No. 796, p. 25, July 11, 1936.

3233. SCIENTIFIC AMERICAN, "Sound Waves Locate Underground Rock," Vol. 154, No. 5, p. 271, 1 fig., New York, May, 1936. F.D.H.

3234. SEZAWA, Katsutada, "On the Relation Between Seismic Origins and Radiated Waves," *Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 149-156, bib., Tokyo, June, 1936.

3235. SEZAWA, Katsutada, and KANAI, Kiyoshi,

- (1) "Damped Free Oscillation and Amplitudes in Resonance, with Special Reference to Decay of Seiches in Straits," *Bul. Eq. Res. Inst.*, Vol. 14, Part 1, 1-9, 9 fig., bib., Tokyo, 1936.
- (2) "Elastic Waves Formed by Local Stress Changes of Different Rapidities," *Ibid.*, 10-17, 4 fig.
- (3) "Energy Dissipation in Seismic Vibrations of Actual Buildings of Unlike Structure," *Ibid.*, 119-133, 10 fig., 7 tab.
- (4) "Energy Dissipation in Seismic Vibrations of a Six-storied Structure. Coincidence of Resonance and Corresonance," *Ibid.*, 134-145, 3 fig., bib. K.S.

3236. SEZAWA, Katsutada, and KANAI, Kiyoshi,

- (1) "The Nature of Transverse Waves Transmitted Through a Discontinuity Layer," *Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 157-163, 3 fig., bib., Tokyo, June, 1936.
- (2) "Improved Theory of Energy Dissipation in Seismic Vibrations of a Structure," *Ibid.*, 164-188, bib.
- (3) "Energy Dissipation in Seismic Vibrations of a Seven-storied Structure. Nature of Corresonance," *Ibid.*, 189-200, 4 fig., 1 tab., bib. K.S.

3237. SHAND, S. J., "Rift Valley Impressions," *Geol. Mag.*, No. 865, Vol. 73, 307-312, London, July, 1936.

— SHARPE, J. A., "Instrumental Determination of the Extent of the Focal Region of an Earthquake" (abstract). See No. 3152 of this list.

3238. SHEPARD, F. P., "Submerged Valleys on Continental Slopes and Changes of Sea Level," *Science*, No. 2165, Vol. 83, 620-621, bib., New York, June 26, 1936.

See also "Submarine Canyons," *Ibid.*, No. 2164, p. 6, (Supp.), June 19, 1936.

3239. SLOTNICK, M. M., "On Seismic Computations, with Applications, I," *Geoph.*, Vol. 1, No. 1, 9-22, 6 fig., Houston, Jan., 1936. R.R.B.

— SLOTNICK, M. M., "On Seismic Computations, II," and "A Simplified Circuit of the Seismic-Electric Method and its Steady State Solution" (titles only). See No. 3240 of this list.

— SMITH, G. H., and JOHNSON, N. G., "Explosives for Seismic Prospecting" (title only). See No. 3240 of this list.

3240. SOCIETY OF PETROLEUM GEOPHYSICISTS. At the meeting of the above society, held at Tulsa, March 19-21, 1936, the following papers of particular interest to seismologists were presented:

- (1) GUTENBERG, B., "Some Theoretical Problems, Concerning the Seismic Method."
- (2) SLOTNICK, M. M., "On Seismic Computations, II."
- (3) BURROWS, L. A., "Relation between Firing Current and Performance in Seismograph Caps."
- (4) LEET, L. DON, "Refraction and Reflection Fan to 187.8 km."
- (5) WEATHERBY, B. B., "The Organization of an Effective Exploration Department."
- (6) VAN ORSTRAND, C. E., "Geothermal Methods of Estimating the Age of the Earth."
- (7) RIEBER, F., "Controlled Directional Sensitivity; a Method for Adapting Reflection Methods to Complex Structures."
- (8) MACELWANE, J. B., S.J., "Absolute and Relative Energy Relations in Reflection and Refraction of Elastic Waves."
- (9) KLIPSCH, P. W., "Some Aspects of Multiple Recording."
- (10) BRYAN, A. B., "True Ground Motion from Mechanical Seismograph Records."
- (11) IDE, J. M., "Laboratory Determination of Elastic Constants."
- (12) FAUST, L. Y., "Optimum Geophone Spreads for Reflection Surveys."
- (13) HEILAND, C. A., "Notes on Reflections from Steeply Dipping Beds."
- (14) BARAD, J., "Significance of Some Fundamental Properties of Explosives with Special Reference to Geophysical Prospecting."
- (15) THOMPSON, R. R., "The Seismic-Electric Effect; Its Use in Recording Seismic Waves."
- (16) SLOTNICK, M. M., "A Simplified Circuit of the Seismic-Electric Method and its Steady State Solution."
- (17) JOHNSON, N. G., and SMITH, G. H., "Explosives for Seismic Prospecting."
- (18) LEET, L. DON, "True Horizontal Displacements near a Five-ton Blast."

## (19) MORGAN, C. C., "Geophysical Studies in Antarctica."

A complete list of the papers is given on pp. 1821-1823 of *Geophysical Abstracts*, No. 85, reported as No. 3199 of this list. F.W.L.

3241. SOKOLOV, P. T., "Über einige Eigenschaften der Laufzeitfunktion," *Ger. Bei.*, Bd. 47, Heft 3, 267-289, 5 fig., bib., Leipzig, 1936.

3242. SOUTHWELL, R. V., "An Introduction to the Theory of Elasticity for Engineers and Physicists." Oxford University (Clarendon) Press, ix+510 pp. Price 30s. net. London, 1936.

A long review by S. Timoshenko appears on pp. 54-55 of *Nature*, No. 3480, Vol. 138, London, July 11, 1936.

3243. STAUSS, H. E., "The Cooling of the Earth as a Problem in Metallurgy," *Sc. Month.*, Vol. 42, No. 4, 371-373, New York, Apr., 1936.

— STILES, M. E., and ROSAIRE, E. E., "Exploration on the Gulf Coast, to 1936." See No. 3224 of this list.

3244. STILLE, HANS, "The Present Tectonic State of the Earth," *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 7, 849-880, 2 fig., bib., Tulsa, July, 1936.

3245. STOCKDALE, Paris B., "Montlake—An Amazing Sinkhole," *Jour. Geol.*, Vol. 44, No. 4, 515-522, 3 fig., 1 tab., Chicago, May-June, 1936.

3246. SWEET, H. A., "Elevated Tanks in Earthquakes," *Eng. N.-R.*, Vol. 117, No. 3, 94-95, New York, July 16, 1936.

See also p. 97 of same issue for editorial comment under the heading "Earthquake-proof Tank Towers."

3247. TAMS, E., "Die neuen Schweremessungen auf dem Meere und ihre Deutung (Schwere-Expeditionen 1923 bis 1932)," *Zeit. Geoph.*, Jahr. 11, Heft 4-5, 235-246, 6 fig., bib., Braunschweig, 1935. E. Tams.

3248. TAYAMA, Risaburo, "Landslide in Dainenzi Hill, Sendai," *Bul. Eq. Res. Inst.*, Vol. 14, Part 2, 271-284, 18 fig., Tokyo, June, 1936.

The paper is in Japanese with a short abstract in English.

3249. TERADA, T., and MIYABE, N., "Crustal Deformation along the Line of Levels from Miyako to Aomori," *Proc. Imp. Acad.*, Vol. 12, No. 1, 4-6, 2 fig., bib., Tokyo, Jan., 1936.

— THOMPSON, R. R., "The Seismic-Electric Effect; Its Use in Recording Seismic Waves" (title only). See No. 3240 of this list.

3250. TIBBETTS, F. H., "Earthquake-Proof Earth Dams," *Eng. N.-R.*, Vol. 117, No. 1, 10-13, 4 fig., New York, July 2, 1936.

Five storage dams on water-deposited soils over the shattered and shaken bed rock between the historic San Andreas and Hayward faults in California have earthquake resisting sections.

See also editorial comment on p. 24 of same issue of *Eng. N.-R.* On p. 96 of the issue of this periodical for July 16 (No. 3) is an editorial note under the heading "For Safe Dams" which indicates that a recent survey of dams in California has found that about a third of them are in need of repair. The question "Are Our Dams Safe?" is raised on the title page of Vol. 117, No. 2, *Eng. N.-R.*, July 9, 1936.

— TIMOSHENKO, S., "An Introduction to the Theory of Elasticity, etc.," a Review. See No. 3242 of this list.

3251. TOMPKINS, Frederick A., "Fundamental Photographic Processing Operations Influencing Production of Seismograph Records," *Geoph.*, Vol. 1, No. 1, 107-114, Houston, Jan., 1936. R.R.B.

3252. TOYOOKA OBSERVATORY, "The Observation of the Tilting of the Earth Crust at the Toyooka Observatory," *Seis. Bull. Kobe*, Vol. 10, No. 4, 184-185, 2 pl., Kobe, May, 1936.

Toyooka Observatory is a branch of the Kobe Meteorological Observatory. The epicentre of the Tango earthquake of 1927 is about 22 miles east of Toyooka. The tilting was measured for the purpose of determining the after effects of this and the earthquake of 1925. An Ishimoto tiltmeter was used.

3253. TUCKER, W. S., "Direction Finding by Sound," *Nature, Sup.*, No. 3481, Vol. 138, 111-118, 4 fig., bib., London, July 18, 1936.

3254. TYCOS,

(1) "Earthquake Predictors Being Tested," *Tycos* (Organ of Taylor Instrument Companies), Vol. 25, No. 2, p. 74, Rochester, 1935.

(2) "Seismogram of Indian Quake," *Ibid.*, No. 3, p. 111, 1 fig., 1935.

The first of the above notes refers to the tiltmeters now being tested in California.

— UHRIG, L., PYE, W., and SCHAFER, S., "Earthquake of February 26, 1932" (abstract). See No. 3152 of this list.

3255. ULLER, Karl, "Die Entwicklung des Wellen-Begriffes, IX," *Ger. Bei.*, Bd. 47, Heft 3, 299-320, 2 fig., bib., Leipzig, 1936.

— ULRICH, Franklin P., "Helena Earthquakes," and "Progress Report of California Seismological Program" (abstracts). See No. 3152 of this list.

— VAN ORSTRAND, C. E., "Geothermal Methods of Estimating the Age of the Earth" (title only). See No. 3240 of this list.

3256. VISSER, S. W.,

(1) "Aardbevingen en getijden te Amboina in 1932," *Natuur. Tijd.*, Vol. 93, 143-147, Batavia, 1933.

(2) "Vulkanische verschijnselen en Aardbevingen in den O. I. Archipel dedurende het jaar 1932," *Ibid.*, 183-229.



3257. VISSER, S. W., "Some Remarks on the Deep-focus Earthquakes in the International Seismological Summary," *Ger. Bei.*, Bd. 47, Heft 3, 321-332, 4 fig., 8 tab., bib., Leipzig, 1936.

3258. WADE, Arthur, "New Theory of Continental Spreading" (revision note), *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 3, p. 317, Tulsa, Mar., 1936.

The revisions apply to the paper reported as No. 3032 of these lists.

3259. WAILES, C. D., "Behavior of Structures During the Helena Earthquake," *Build. Stand. Month.*, Vol. 4, No. 10, 3-6, 2 fig., Los Angeles, Dec., 1935. B.S.M.

— WAILES, C. D., "Investigation of Damage to Buildings in Helena, Montana, Following Earthquakes of October, 1935" (abstract). See No. 3152 of this list.

— WASHBURN, H. Bradford, Jr., "The Harvard-Dartmouth Alaskan Expeditions, 1933-1934." See No. 3173 of this list.

— WEATHERBY, B. B., "The Organization of an Effective Exploration Department" (title only). See No. 3240 of this list.

3260. WESTLAND, A. J., S.J., "A Comparison of Old and New Methods in the Analysis of the September 9, 1931, Earthquake," *Bul. S.S.A.*, Vol. 26, No. 2, 119-124, 3 fig., Berkeley, Apr., 1936.

3261. WHIPPLE, F. J. W., "On the Theory of the Strains in an Elastic Solid Bounded by a Plane when There is a Nucleus of Strain at an Internal Point, and on the Relation of the Theory to Seismology," *M.N., Geoph. Sup.*, Vol. 3, No. 9, 380-388, 2 fig., bib., London, Apr., 1936. E.T.

3262. WHIPPLE, F. J. W., and LEE, A. W., "Notes on the Theory of Microseisms," *M.N., Geoph. Sup.*, Vol. 3, No. 8, 287-297, 1 fig., bib., London, Dec., 1935. E.T.

— WHIPPLE, F. J. W., *et al.*, "Seismological Investigations: Fortieth Report of the Committee on Seismology of the British Association for the Advancement of Science." See No. 2856 (1) of these lists.

— WILSON, James T., "Foreshocks and Aftershocks of the Nevada Earthquake of December 20, 1932, and the Parkfield Earthquake of June 7, 1934" (abstract). See No. 3152 of this list.

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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.

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**Bibliography of Seismology**

Vol. XII

No. 12

(Items 3267—3370)

OCTOBER, NOVEMBER, DECEMBER, 1936

BY

ERNEST A. HODGSON

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(2) "Confronto delle profondità ipocentrali di due recenti terremoti consimili," *Rend. R. Accad. Naz. Lincei, Cl. Sc.*, Vol. 23, Semi-fasc. 11, 859-864, 2 tab, bib., Rome, 1936. G.A.

(3) "La frana di Marino registrata nel R. Osservatorio Geodinamico di Rocca di Papa," *Bol. Soc. Sis. Ital.*, Vol. 34, Fasc. 3-4, 101-115, 3 fig., bib., Rome, 1936. G.A.

— AGAMENNONE, G., and SOMVILLE, O., "Eugene Lagrange" (an obituary). See No. 3355 of this list.

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The report of the Section of Seismology appears on pages 75-116. For titles of papers and their position in the report see under the following author names: Slichter, Hodgson, Barton, Eickelberg, Stechschulte, Ruge, Gebhardt, Macqueen, Landsberg, Heck, Rutherford, Schon, Blake, Delaney, Collins, Lynch, Merritt, Bodle, Thom, Neumann, and Joerg.

On page 32 appears a resolution on the death of Arthur J. Weed. Copies of this resolution were sent to Mr. Weed's family and to the President of the University of Virginia.

Many papers in sections other than that of seismology are of interest to seismologists. A complete list of titles cannot be given here.

— BAIN, George W., "Spontaneous Rock Expansion" (abstract). See No. 3289 of this list.

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3275. BOWIE, William, "Geodetic Operations in the United States, January 1, 1933, to December 31, 1935," *U.S.C.G.S., Spec. Pub.*, No. 207, 25 pp., Washington, 1936.

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The paper describes the various phenomena of plastic flow under shearing stress at confining pressures up to 50,000 kg/cm<sup>2</sup>.

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- The paper is in Russian with an abstract in English. The author lists a total of 41 earthquake scales of intensity with their dates of publication. N.V.R.
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- CHAMBERLIN, Rollin T., "The Snellius Expedition in the Eastern Part of the Netherlands East Indies 1929-1930, Vol. V: Geological Results, Part I—Geological Interpretation of the Bathymetrical Results." See No. 3320 of this list.
- COLLINS, Mary P., "Local Earthquakes in New England, 1934-1935" (abstract). See p. 103 of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- COULOMB, J., and GRENET, G., "Construction d'un séismographe d'essai." See No. 3293 of this list.



— CRAWY, A. P., RUTHERFORD, H. M., and EWING, Maurice, "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain: Part I—Methods and Results" (abstract). See No. 3289 of this list. Part II of this paper is listed under Miller.

— DALY, Reginald A., "Origin of Submarine 'Canyons'" (abstract). See No. 3289 of this list.

3282. DAVISON, Charles, "The Formosa Earthquake of April 21, 1935," *Nature*, No. 3487, Vol. 138, p. 353, London, Aug. 29, 1936.

The above short paper is a review of Supplementary Vol. 3 of the *Bulletin of the Earthquake Research Institute*, which deals entirely with the subject indicated. It is an extraordinarily adequate and satisfying review of an important publication (in Japanese) on the serious earthquake in Formosa.

— DELANEY, John P., S.J., "Seismographic Tilt-measurements at Buffalo" (abstract). See pp. 102-103 of the *Trans. A.G.U.*, reported as No. 3269 of this list.

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3284. DISIN. The following papers have appeared in the above publication published in Tokyo. All are in the Japanese language. The two numbers in brackets after each entry indicate respectively the page and the serial number of the English abstract of the paper concerned as appearing in the abstracts section of *Jap. Jour. Ast. Geoph.*, Vol. 13, No. 3, Tokyo, 1936.

- (1) SUMITANI, Keisuke, "Earthquakes in Kagawa Prefecture," Vol. 5, 771-784, 5 fig., 1933. (36, 168).
- (2) KATO, Yosio, "Sur la relation entre le changement du magnétisme terrestre et la sismique et volcanique activité," Vol. 7, 469-472, 1 fig., 2 tab., 1935. (37, 175).
- (3) INOUE, Win, "Simple Instruments Indicating Seismic Intensity," Vol. 5, 750-759, 1933. (39, 189).
- (4) KISHINOUE, Fuyuhiko, "An Apparatus Indicating the Direction of the First Motion of Earthquakes," Vol. 5, 699-703, 2 fig., 1933. (40, 190).
- (5) HUTIDA, Takato, "Sur l'équipement récemment fabriqué du relative mesurage de la gravité employant télégraphie sans fil," Vol. 7, 565-577, 613-629, 5 fig., 1935. (40, 191).
- (6) TAKAHASHI, Ryutaro, "Binaural Receivers Used to Locate a Drilling Place in a Tunnel," Vol. 5, 561-572, 5 fig., 1933. (40, 192).
- (7) SUZUKI, Takeo, "Propagation of Sound Generated by an Explosion of a Powder Magazine at Hamamatu on June 7, 1933," Vol. 5, 497-519, 4 fig., 2 tab., 1933. (44, 213).
- (8) KISHINOUE, Fuyuhiko, "Some Notes on the Sanriku Tunami in 1933," Vol. 5, 760-763, 1933. (50, 230).

— DYK, H., and BYERLY, P., "The Questionnaire Program for Collecting Earthquake Data." See No. 3303 of this list.

3285. EARTHQUAKE RESEARCH INSTITUTE, TOKYO IMPERIAL UNIVERSITY. Supplementary Vol. 3, of the *Bulletin of the Earthquake Research Institute*, is devoted to a series of papers and reports dealing with the Formosa earthquake of 1935. The entire publication is in Japanese with the exception of the abstracts of the papers which are in English. The papers are listed in this issue of the *Bibliography* under the respective author names: Hagiwara, Honma, Inomata, Kawasima, Kawasumi, Miyabe, Nasu, Otuka, Saita, Suzuki, and Takahasi.

The reports are entirely in Japanese except for a series of English titles as follows:—

- (1) "Seismometrical Report on the Formosa Earthquake of April 21, 1935, Observed at Hongo, Tokyo."
- (2) "Field Investigations."
- (3) "Statistics of Damages."
- (4) "Results of the Re-triangulation and Re-levelling in the Region Affected by the Earthquake."
- (5) "The After-shocks of August 17, 1935."
- (6) "Maps and Photographs."

The maps and photographs are exceptionally well reproduced. There are 21 maps in addition to an index map, and 242 photographs. The titles descriptive of the photographs are in English as well as in Japanese.

— EICKELBERG, E. W.,

- (1) "Progress-report in Seismology for the United States Coast and Geodetic Survey." See pp. 77-80, (1 fig., 1 tab.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- (2) "Review of Earthquakes for the Past Year," *Ibid.*, pp. 93-95 (1 fig.)

3286. ELECTRONICS, "Depth Sounding by Radio," *Electronics*, Vol. 9, No. 10, 20-21, 5 fig., New York, Oct., 1936.

The article describes the methods used by the U.S. Coast and Geodetic Survey to measure depth. The source of sound used is an explosion. Recording is done on receivers placed sometimes as much as 45 miles distant from the blast.

3287. ELIEL, LEON T., and MEYER, WILLIAM H., JR., "Aerial Geologizing," *A.I.M.M.E., Tech. Pub.*, No. 756, 27 pp., New York, 1936.

The pamphlet presents introductory remarks by Theodore Marvin and two papers on the subject indicated, together with the discussion which followed. The papers by the two authors respectively were as follows: "Aerial Reconnaissance and Contour Mapping in Mining," and "Development of Aerial Photographic Equipment."

3288. ENGINEERING NEWS-RECORD. Volume 117 of the above periodical (New York, 1936) contains the following short items of interest to seismologists:

- (1) "Cisterns Store Water for Fires Where Earthquakes Menace Mains," No. 7, 223-224, Aug. 13.

San Francisco has built a system of underground storages distributed throughout the city. Cisterns are located at street intersections. They have a capacity of 75,000 gal. and cost \$6,000. Pipe connections are omitted for safety.

- (2) "Unsafe Dam Design," No. 19, p. 656, Nov. 5.

See also the article in the same issue, pp. 644-647, by Fred D. Pyle, entitled, "Hodges Dam Strengthened." The editorial and the article refer briefly to the need for special precautions in the design of dams in seismic regions.

- (3) "Earthquakes," No. 13, 452-453, Sept. 24.

A review of two publications by N. H. Heck listed in this issue of the *Bibliography* as Nos. 3302 (2) and 3303.

- (4) "Simpler Seismic Analysis," No. 17, 590-591, Oct. 22.

Refers to the need for simple and effective design procedure to ensure safe construction in earthquake regions.

— EWING, Maurice, CRARY, A. P., and RUTHERFORD, H. M., "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain: Part I—Methods and Results" (abstract). See No. 3289 of this list. Part II of this paper is listed under Miller.

— FENNEMAN, Nevin M., "Presentation Address" (Presentation of the Penrose Medal to Reginald A. Daly). See No. 3289 of this list.

— FIELD, R. M., "Role of Geophysics in Submarine Geology" (abstract). See No. 3289 of this list.

— GEBHARDT, R. E., "Improvements in Strong-motion Seismographic Equipment." See pp. 84-85 (3 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.

3289. GEOLOGICAL SOCIETY OF AMERICA, "Proceedings of the Geological Society of America for 1935," 483 pp., New York, 1936.

The first 136 pages are devoted to a report on the New York meeting of Dec. 26-28, 1935. Abstracts of papers of interest to seismologists are noted in the present issue of the *Bibliography* under the names of authors as follows: Bain, Daly, Ewing (Crary and Rutherford), Field, Goldthwait, Griggs, Leith and Sharpe, Miller, Shepard, Stetson, Willis.

Pages 323-354 present the *Proceedings of the Stanford Meeting of the Cordilleran Section, Apr. 12-13, 1935*. Abstracts of papers of interest to seismologists are noted in this list under the authors' names as follows: Gutenberg and Buwalda, Jenkins, Willis.

The *Proceedings of a Joint Session of Section E of the A.A.A.S. and the Geological Society of America at Saint Louis, Dec. 30-31, 1935*, are reported on pages 433-442. Papers of interest to seismologists, represented in the report by abstracts, are indicated in this list by the names of authors as follows: Heck and McComb, Hodgson.

On pages 48-53 appears on account of the presentation of the Penrose Medal to R. A. Daly. The presentation address was made by Nervin M. Fenneman. The address and the reply of Prof. Daly are reported in full.

An unusually large number of obituaries appear in the section devoted to them (pp. 157-322). One of these is the memorial to Bundjiro Koto (pp. 263-272), by T. A. Jaggar.

3290. GERMANT, A., "Compressional Waves in Media with Complex Viscosity," *Physics*, Vol. 6, No. 11, 363-365, Lancaster, Nov., 1935.

3291. GLENNIE, E. A., "Gravity Anomalies in the United States," *Jour. Geol.*, Vol. 44, No. 7, 765-782, 4 fig., Chicago, Oct.-Nov., 1936.

— GOLDTHWAIT, James Walter, "Stability of Land and Sea at Salem, Massachusetts" (abstract). See No. 3289 of this list.

3292. GREENSPAN, Reuben, "Science and Earthquakes," *Wynn's Astrology Magazine*, Vol. 6, No. 2, 2-3, East Stroudsburg, Pa., Dec., 1935. J.D.

The publishers announce: "*Predicting Earthquakes* is the subject of Reuben Greenspan's first book. Mr. Greenspan has amazed scientists, newspaper editors and the public with the accuracy of his published predictions of when and where major earthquakes would occur. This book, published here for the first time, will include the following: Planets and gravitation, Application of astronomy to geology, Hypothesis of predicting an earthquake, Psychology of earthquakes and their effect on the human race."

It would be difficult to find a more suitable place to publish this book. E.A.H.

3293. GRENET, G., and COULOMB, J., "Construction d'un séismographe d'essai," *Bul. Inst. et Obs. Phys. Gl., Puy-de-Dôme*, No. 8, 6 pp. in reprint, 2 fig., 1 pl., Puy-de-Dôme, 1936. J.C.

3294. GRIGGS, David T., "Deformation of Rocks under High Confining Pressures," *Jour. Geol.*, Vol. 44, No. 5, 541-577, 14 fig., bib., Chicago, July-Aug., 1936.

An important contribution to this subject of so much interest to seismologists—as to all geophysicists.

— GRIGGS, David T., "Strength of Rocks under High Pressure" (abstract). See No. 3289 of this list.

3295. GRIME, G., "The Determination of Young's Modulus for Building Materials by a Vibration Method," *Phil. Mag.*, No. 132, Vol. 20, 304-310, London, Aug., 1935.



## 3296. GUTENBERG, B.,

- (1) "The Amplitudes of Waves to be Expected in Seismic Prospecting," *Geophysics*, Vol. 1, No. 2, 252-256, 1 fig., bib., Tulsa, July, 1936.
- (2) "Structure of the Earth's Crust and the Spreading of the Continents," *Bul. Geol. Soc. Am.*, Vol. 47, No. 10, 1587-1610, 2 fig., bib., New York, Oct. 31, 1936.

— GUTENBERG, B., "Periods of the Ground in Southern California Earthquakes." See No. 3303 of this list.

— GUTENBERG, B., and BUWALDA, J. P., "Seismic Reflection Profile across Los Angeles Basin" (abstract). See No. 3289 of this list.

3297. HAGIWARA, Takahiro, "Observation of Changes in Earth Potential at Syukkoko and Kinsui, Formosa" (Japanese with English abstract), *Bul. Eq. Res. Inst.*, Supp. Vol. 3, 87-92, 7 fig., Tokyo, Mar., 1936.3298. HAGIWARA, Takahiro, "Report on the Work of the Earthquake Research Institute, Tokyo Imperial University, During the Years 1933-1934," *Ger. Bei.*, Bd. 48, Heft 1, 94-108, 9 fig., bib., Leipzig, 1936.

The above is the seventh report of the series, the other six having been listed under the name of C. Tsuboi.

## 3299. HAYES, R. C.,

- (1) "Normal and Deep Earthquakes in the Southwest Pacific," *Dom. Obs. (N.Z.) Bul.*, No. 109, 691-701, 2 fig., 6 tab., bib., Wellington, 1936.
- (2) "Earthquakes and Atmospheric Pressure: The Influence of Pressure and Pressure Changes on the Occurrence of New Zealand Earthquakes," *Ibid.*, No. 110, 713-716, 2 tab., bib., 1936. R.C.H.

3300. HAYES, R. C., "Reliability of Seismograph Stations," *Nature*, No. 3489, Vol. 138, 463-464, London, Sept. 12, 1936.

A comment on the recent paper by Harold Jeffreys on the same subject, reported as No. 3188 (3) of these lists. Dr. Jeffreys replies to the comment in a short note immediately following. He defends his deductions in some measure, but admits the weakness of the data on which his original far-reaching conclusions were drawn.

The data given by the International Seismological Summary serve many highly-useful purposes but, in the opinion of the undersigned, they do not lend themselves to analyses such as the one made by Jeffreys. E.A.H.

3301. HAZEN, H. L., JAEGER, J. J., and BROWN, G. S., "An Automatic Curve Follower," *R.S.I.*, Vol. 7, No. 9, 353-357, Lancaster, Sept., 1936.

## 3302. HECK, N. H.,

- (1) "Microseisms and Meteorology," *Geog. Rev.*, Vol. 26, No. 3, p. 508, New York, July, 1936.

A brief discussion of a paper by Donald C. Bradford, published in the *Bul. S.S.A.* and reported in these lists as No. 3052 (2).

- (2) "Earthquakes," Princeton University Press, 222 pp., 88 fig. Price \$3.50. Princeton, 1936.

This book, by the Chief of the Division of Terrestrial Magnetism and Seismology, of the U.S. Coast and Geodetic Survey, is written for the benefit of the lay reader. The author is particularly well fitted to write the book, bringing to it not only his wide experience in the operation of his own organization in the United States and its dependencies, but also the knowledge he has gained through his international activities. The book is absolutely free from padding—every sentence conveys its part of the information.

In addition to much general descriptive material about earthquakes in general, there are detailed accounts of many particular cases. These illustrate the general theory of the nature and cause of earthquakes which the author gives.

It is but natural, as is stated in the preface, that the illustrations and descriptions should show evidences of the author's viewpoint—the United States.

The book was chosen as the Scientific Book of the Month. A careful perusal of its pages will afford an excellent general idea of the scope and nature of the study of earthquakes. E.A.H.

3303. HECK, N. H., *et al.*, "Earthquake Investigations in California, 1934-1935," *U.S.C.G.S., Spec. Pub.*, No. 201, 231 pp., 124 fig., num. tab., Washington, 1936.

This report may be obtained from the Supt. of Documents, Washington, D.C., for thirty-five cents. The subjects dealt with are as follows:

Preface. HECK, N. H.

Chap. 1. ULRICH, F. P., "Field Parties and Problems."

Chap. 2. HECK, N. H., McCOMB, H. E., and ULRICH, F. P., "Strong-motion Program and Tiltmeters."

Chap. 3. NEUMANN, F., "The Analysis of Records."

Chap. 4. BYERLY, P., and DYK, H., "The Questionnaire Program for Collecting Earthquake Data."

Chap. 5. CARDER, D. S., and JACOBSEN, L. S., "Vibration Observations."

Chap. 6. McLEAN, R. S., and MOORE, W. W., "Vibration Studies."

Chap. 7. BLUME, J. A., and JACOBSEN, L. S., "The Building and Ground Vibrator."

Chap. 8. MARTEL, R. R., "A Report on Earthquake Damage to Type III Buildings in Long Beach."

Chap. 9. GUTENBERG, B., "Periods of the Ground in Southern California Earthquakes."

Chap. 10. BENIOFF, H., "Preliminary Report on Four-unit Portable Seismograph."

Chap. 11. REYNOLDS, W. F., and RAPPEYE, H. S., "Geodetic Work in Earthquake Regions in California."

— HECK, N. H., "Relation of Earthquake-belts of the Pacific and Indian Oceans to Submarine Topography." See pp. 92-93 (1 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.

— HECK, N. H., and McCOMB, H. E., "Some Observations on Recent Progress in Seismology" (abstract). See No. 3289 of this list.

3304. HEILAND, C. A.,

(1) "Geophysical Mapping from the Air: "Its Possibilities and Advantages," *Eng. Min. Jour.*, Vol. 136, No. 12, 609-610, New York, Dec., 1935.

Should the present trend toward accuracy rather than toward speed, in making land observations, so change that more rapid work would become desirable, it should not be hard to modify magnetic, gravimetric, electro-magnetic, inductive, and radio-active methods for use in a moving vehicle—the airplane among others. But this has not been attempted save in a single instance. C.A.H.

(2) "Note on Reflections from Steeply Dipping Beds," *Geophysics*, Vol. 1, No. 2, 257-270, 11 fig., Tulsa, July, 1936.

3305. HEISKANEN, W., "The Present State of Isostasy," *Travaux de l'Association de Géodésie, L'Union Géodésique et Géophysique Internationale*, Tome 12, Rapports Généraux, Lisbonne, 14-25, septembre 1933, 50 pp. Paris, 1935.

3306. HODGSON, Ernest A., "Methods of Locating Epicentres of Earthquakes" (summary), *The Canadian Surveyor: Proceedings of the Twenty-ninth Annual Meeting of the Canadian Institute of Surveying*, Ottawa, Feb. 5-6, 1936, 64-66, Ottawa, 1936.

— HODGSON, Ernest A., "Progress-report on the Research Connected with the Timiskaming Earthquake of November 1, 1935" (abstract). See p. 76 of the *Trans. A.G.U.*, reported as No. 3269 of this list.

— HODGSON, Ernest A., "Canadian Earthquake of November 1, 1935" (abstract). See No. 3289 of this list.

— HONMA, Syosaku, and KAWASUMI, Hiroshi, "On a Problem Concerning the Internal Structure of the Earth as Discussed from the Time-Distance Curve of the Formosa Earthquake of April 20, 1935." See No. 3316 of this list.

3307. INNES, John R., "Flash Spotters and Sound Rangers: How They Lived, Worked, and Fought in the Great War," George Allen and Unwin, Ltd., 308 pp. Price \$2.50. London, 1936.

A brief review by E. E. Rosaire appears on pp. 278-279 of *Geophysics*, Vol. 1, No. 2, Tulsa, July, 1936.

- INOMATA, Sinzaburo, and MIYABE, Naomi, "Mechanical Strength of 'Dokaku'." See No. 3330 of this list.

3308. INTERNATIONAL GEOLOGICAL CONGRESS, "Report of the XVI Session, United States of America," 2 vols., 1342 pp., 82 papers, 68 abs., many illus. Published by the Congress. Price \$10 per set, \$5 per vol. Washington, 1936.

For a review by L. C. Snider, see pp. 1375-1376, *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 10, Tulsa, Oct., 1936.

- JACOBSEN, L. S., and BLUME, J. A., "The Building and Ground Vibrator." See No. 3303 of this list.

- JACOBSEN, L. S., and CARDER, D. S., "Vibration Observations." See No. 3303 of this list.

- JAEGER, J. J., BROWN, G. S., and HAZEN, H. L., "An Automatic Curve Follower." See No. 3301 of this list.

3309. JAGGAR, T. A., "Memorial of Bundjiro Koto," *Proc. Geol. Soc. Am.*, 263-272, New York, 1936.

A complete bibliography is appended. Quite a number of the publications indicated deal with seismology from the point of view of a geologist.

3310. JAGGAR, T. A., "Hawaiian Volcano Observatory," *Volcano Letter*, No. 435, 1-6, Hawaii, May, 1936.

The article describes, with 8 illustrations, the routine followed in servicing the seismographs at the institution indicated.

3311. JAMESON, M. H., "Geophysical Prospecting in the Witwatersrand Goldfields," *Mines Mag.*, Vol. 26, No. 8, 7-8, 29, 2 fig., Golden, Aug., 1936.

3312. JEFFREYS, Harold, "The Problem of Oceanic Structure," University Press, Cambridge, 15 pp., 1936.

The above forms a communication by the author to the International Union of Geodesy and Geophysics, Edinburgh Meeting, 1936. H.J. + A.G.U.

- JEFFREYS, Harold, "Reliability of Seismograph Stations." See No. 3300 of this list.

- JENKINS, Olaf P., "Progress Report on the New State Geological Map of California" (abstract). See No. 3289 of this list.



- JOERG, W. L. G., "Comment on F. W. Schon's Paper, 'Transforming the Stereographic Map'." See pp. 115-116 of the *Trans. A.G.U.*, reported as No. 3269 of this list.
3313. JOHNSON, N. G., and SMITH, G. H., "Explosives for Seismic Prospecting," *Geophysics*, Vol. 1, No. 2, 228-238, 8 fig., 1 tab., Tulsa, July, 1936.
3314. JONES, H. Spencer, "The Royal Research Ship *Research*," *Nature*, No. 3484, Vol. 138, 230-232, London, Aug. 8, 1936.
3315. KAWABATA, Yukio, "Geoid and Crustal Deformation in the Kwanto District," *Geoph. Mag.*, Vol. 10, No. 1, 89-110, 2 fig., 8 maps, 5 tab., bib., Tokyo, Aug., 1936.
- KAWASIMA, Syozi, and MIYABE, Naomi, "Change in Level of the Water of a Well and Aftershocks." See No. 3331 of this list.
3316. KAWASUMI, Hiroshi, and HONMA, Syosaku, "On a Problem Concerning the Internal Structure of the Earth as Discussed from the Time-Distance Curve of the Formosa Earthquake of April 20, 1935" (Japanese with English abstract), *Bul. Eq. Res. Inst.*, Supp. Vol. 3, 10-21, 4 fig., bib., Tokyo, Mar., 1936.
3317. KING, Louis Vessot, "On the Limiting Strength of Rocks under Conditions of Stress Existing in the Earth's Interior," *Jour. Geol.*, Vol. 20, No. 2, 119-138, 2 fig., Chicago, Feb.-Mar., 1912.
3318. KÖHLER, R., "Messung der Schwingungskennziffern und Herabminderung der Erschütterungen in einer Kohlenwäsche," *Zeit. Geoph.*, Jahr. 12, Heft 4, 148-166, 14 fig., bib., Braunschweig, 1936.
- The above paper is No. 23 of the series: *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.
3319. KORIDALIN, E. A., MASSARSKIJ (MASSARSKI), S. J., and OSTROVSKIJ (OSTROVSKI), A. E., "Reflected Waves in Seismic Prospecting from the Field Work Experience at Ishimbaievo," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 74, 46 pp., 20 fig., 4 tab., bib., Moscow-Leningrad, 1936.
- The paper is in Russian with a long review in English. N.V.R.
3320. KUENEN, P. H., "The Snellius Expedition in the Eastern Part of the Netherlands East Indies 1929-1930, Vol. V: Geological Results, Part I: Geological Interpretation of the Bathymetrical Results," *Kemink en Zoon N. V.*, 124 pp., 47 fig., 9 pl., Utrecht, 1935.
- A lengthy review by R. T. Chamberlin appears on pp. 648-650 of *Jour. Geol.*, Vol. 44, No. 5, Chicago, July-Aug., 1936.
3321. LAMONT, Archie, "Palæozoic Seismicity," *Nature*, No. 3484, Vol. 138, 343-344, 1 fig., London, Aug. 8, 1936.

3322. LANCASTER-JONES, E., "Geophysical Prospecting," *Reports on Progress in Physics*, Vol. 2, 91-128, London, 1936.

A review by M. M. Slotnick appears on page 278 of *Geophysics*, Vol. 1, No. 2, Tulsa, July, 1936.

3323. LANDSBERG, H., "Note on Earthquake Intensities on Different Floors of Houses," *Ger. Bei.*, Bd. 48, Heft 1, 84-85, 1 tab., bib., Leipzig, 1936.

— LANDSBERG, H., "A Genetic System of Earthquake-origin." See pp. 89-92 (2 tab., bib.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.

3324. LEE, Frederick, W., "Geophysical Abstracts," No. 86, Washington, June, 1936. F.W.L.

The following note appears on the cover page of this issue: "On July 1, 1936, the Geophysical Section of the U.S. Bureau of Mines was transferred by Act of Congress to the U.S. Geological Survey. Accordingly, this number of *Geophysical Abstracts* will be the last issued by the Bureau of Mines. It is understood that the Geological Survey plans to publish this information annually, instead of monthly as heretofore."

The series of *Geophysical Abstracts* began in May, 1929, and has been continued monthly since without interruption. It has been a most valuable contribution to the bibliography of geophysics. The monthly issues will be missed by many workers in this field. E.A.H.

— LEITH, Andrew, and SHARPE, J. A., "Deep-focus Earthquakes and the Strength of the Earth" (abstract). See No. 3289 of this list.

3325. LYNCH, Joseph, S.J., "Recent Progress in Earthquake Science," *Scien. Amer.*, Vol. 155, No. 2, 88-89, 4 fig., New York, Aug., 1936.

What actually causes earthquakes?—How deep do they originate?—Is the Earth's core a solid or a liquid?—The more we learn the less we know. F.D.H.

— LYNCH, Joseph, S.J., "The New Seismic Vault at Fordham" (abstract). See p. 103 of the *Trans. A.G.U.*, reported as No. 3269 of this list.

3326. MACELWANE, James B., S.J., "Introduction to Theoretical Seismology: Part I, Geodynamics," John Wiley and Sons, 366 pp., 67 fig., 40 tab., 15 pl. Price \$6 net. New York, 1936.

Part II of this work, by F. W. Schon, S.J., is reported as No. 1376. It was published in 1932.

Part I, here reported, is of format similar to the earlier published Part II. It is provided with a carefully prepared index which should help to make it useful as the text-book it is intended to be.

The book gives a mathematical treatment of the following subjects: Stresses in an elastic solid; Elastic strain; Elastic body waves; Surface waves; Vector treatment of elastic waves (by F. W. Sohon, S.J.); Reflection and refraction of elastic waves; Paths of seismic rays. The last three chapters deal, in order, with the Interpretation of seismograms; Determination of epicentres; Depth of focus.

The vector treatment of Chapter VI covers briefly the ground of the previous five chapters. The different notation permits briefer formulas and the details required to develop the theory are here omitted. The chapter is useful as a summary and as a demonstration of the convenience of the vector notation.

The chapter on reflection and refraction is made particularly useful by the adoption of a common reference frame for the development after Knott, after Zoeppritz, and after Blut. The comparison of the resulting Knott and Zoeppritz equations is clearly brought out.

The treatment of the Herglotz-Wiechert method of determining a velocity-depth curve is developed first for ideal conditions and then modified to take care of existing conditions. The mathematical treatment is very carefully worked out in complete detail. Its application is later summarized for the convenience of the student.

E.A.H.

- MACQUEEN, P. O., "Sand-craters and Their Possible Significance." See pp. 85-89 (4 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- MARTEL, R. R., "A Report on Earthquake Damage to Type III Buildings in Long Beach." See No. 3303 of this list.
- MARTIN, J. M., and NASH, H. E., "Significance of Some Fundamental Properties of Explosives, with Special Reference to Geophysical Prospecting." See No. 3334 of this list.
- MASSARSKIJ (MASSARSKI), S. J., OSTROVSKIJ (OSTROVSKI), A. E., and KORIDALIN, E. A., "Reflected Waves in Seismic Prospecting from the Field Work Experience at Ishim-baievo." See No. 3319 of this list.
- MCCOMB, H. E., and HECK, N. H., "Some Observations on Recent Progress in Seismology" (abstract). See No. 3289 of this list.
- MCCOMB, H. E., ULRICH, F. P., and HECK, N. H., "Strong-motion Program and Tiltmeters." See No. 3303 of this list.
- MCLEAN, R. S., and MOORE, W. W., "Vibration Studies." See No. 3303 of this list.
- MERRITT, George, "Correlations between Tilting of the Ground and the Tides in Chesapeake Bay." See pp. 103-104 (1 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- MEYER, William H., Jr., and ELIEL, Leon T., "Aerial Geologizing." See No. 3287 of this list.

3327. MICHLIN, S., "The Plane Strain in Aeolotropic Elastic Media," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 76, 19 pp., Moscow-Leningrad, 1936. N.V.R.

— MILLER, Benjamin L., "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain: Part II—Geologic Significance of the Geophysical Data" (abstract). See No. 3289 of this list. Part I of this paper is listed under the names of Ewing, Crary, and Rutherford.

3328. MITCHELL, Hugh C., "First and Second Order Triangulation in California (1927 Datum)," *U.S.C.G.S., Spec. Pub.*, No. 202, 548 pp. Price 75 cents (from Supt. Documents, Washington, D.C.), 1936.

3329. MIYABE, Naomi, "Recent Seismic Activity in Taiwan" (Japanese with English abstract), *Bul. Eq. Res. Inst., Supp.* Vol. 3, 1-9, 7 fig., 4 tab., Tokyo, Mar., 1936.

3330. MIYABE, Naomi, and INOMATA, Sinzaburo, "Mechanical Strength of 'Dokaku'" (Japanese with English abstract), *Bul. Eq. Res. Inst., Supp.* Vol. 3, 141-147, 2 fig., 4 tab., Tokyo, Mar., 1936.

3331. MIYABE, Naomi, and KAWASIMA, Syozi, "Change in Level of the Water of a Well and Aftershocks" (Japanese with English abstract), *Bul. Eq. Res. Inst., Supp.* Vol. 3, 93-95, 3 fig., Tokyo, Mar., 1936.

— MOORE, W. W., and McLEAN, R. S., "Vibration Studies." See No. 3303 of this list.

3332. MÜHLEN, Walter von zur,

(1) "Seismische Oberflächenwellen und Fragen der Grosstektonik Nord- und Mitteldeutschlands," *Zeit. Deut. Geol. Gesell.*, Bd. 88, Heft. 5, 341-354, 8 fig., 2 tab., bib., Berlin, 1936. W.v.z.M.

(2) "Seismische Bodenunruhe und Brandung," *Zeit. Geoph.*, Jahr. 12, Heft 2-3, 97-111, 2 fig., 5 tab., bib., Braunschweig, 1936.

An investigation of the connection between the microseisms in Hamburg, Potsdam, Taunus Obs., Stuttgart, Strasbourg, and Kew, with the surf in northern and western Europe, from the point of view of Schwinner's theory. E. Tams.

3333. MUREVSKIS, V., "Eine Hilfsgraphik für Berechnung von Epizentren nach der Geiger'schen Methode," Geodaetisk Institut, Kjøbenhavn, Meddelelse No. 7, 7 pp., 1 fig., 1 tab., Kjøbenhavn, Denmark.

3334. NASH, H. E., and MARTIN, J. M., "Significance of Some Fundamental Properties of Explosives, with Special Reference to Geophysical Prospecting," *Geophysics*, Vol. 1, No. 2, 239-251, 5 fig., 5 tab., bib., Tulsa, July, 1936.

3335. NASU, Nobuji, "The After-shocks of the Formosa Earthquake of 1935" (Japanese with English abstract), *Bul. Eq. Res. Inst., Supp.* Vol. 3, 75-86, 13 fig., 3 tab., Tokyo, Mar., 1936.



3336. NATURE. The following notes of interest to seismologists appear in recent issues of Vol. 138 of the above periodical (London, 1936):

- (1) "A Piezoelectric Ultra-micrometer," No. 3482, p. 171, July 25.
- (2) "Tokyo Earthquakes in 1935," No. 3484, p. 252, Aug. 8.
- (3) "Mr. R. D. Oldham, F.R.S.," No. 3486, pp. 316-317, Aug. 22.
- (4) "Seismology in New Zealand," No. 3488, p. 397, Sept. 5.
- (5) "The British Earthquake of April 6, 1580," No. 3489, p. 472, Sept. 12.
- (6) "Carnegie Institution of Washington," No. 3491, pp. 542-543, Sept. 26.
- (7) "Seismology in the United States," No. 3492, p. 582, Oct. 3.
- (8) "International Union of Geodesy and Geophysics," No. 3493, p. 650, Oct. 10.
- (9) "Belluno Earthquake of October 18," No. 3495, p. 713, Oct. 24.
- (10) "The South Sandwich Trench," *Ibid.*, p. 726.
- (11) "Bibliography of Seismology," No. 3498, pp. 836-837, Nov. 14.

3337. NAVARRO NEUMANN, M. Ma. S., S.J., "Sur les causes des tremblements de terre," *Bol. Soc. Sis. Ital.*, Vol. 34, No. 3-4, 87-100, bib., Rome, 1936.

— NEUMANN, Frank, "A Mechanical Method of Analyzing Accelerograms." See pp. 111-115 (2 fig.) of *Trans. A.G.U.*, reported as No. 3269 of this list.

— NEUMANN, Frank, "The Analysis of Records." See No. 3303 of this list.

3338. NISIMURA, Eiiti, "Vibrations of the Aso Volcanological Laboratory Building and Its Surrounding Ground," *Mem. Col. Sc. Kyoto*, Ser. A, Vol. 19, No. 4, 191-206, 2 fig., 4 pl., Kyoto, 1936.

3339. OBSERVATORY, "Geophysical Discussion on 1936 April 24," *The Observatory*, No. 748, Vol. 59, 265-269, London, Sept., 1936.

In addition to a discussion of gravity measurements in Great Britain, the meeting considered a paper by Harold Jeffreys on "The Structure of the Earth down to the 20° Discontinuity" (see No. 3188 (2)).

3340. OCKENDEN, R. E., "Thomas Twyne's Discourse on the Earthquake of 1580," Pen-in-Hand Pub. Co., 44 pp. Price 5s. Oxford, 1936.

The original edition of Twyne's discourse is now very rare. This new edition contains an 8-page bibliography on this earthquake with an epicentre near the east coast of Kent, which occurred on the evening of April 6, 1580, and which shook northern France and Belgium, and England as far as Yorkshire. R.E.O. + E.T.

— OSTROVSKIJ (OSTROVSKI), A. E., KORIDALIN, E. A., and MASSARSKIJ (MASSARSKI), S. J., "Reflected Waves in Seismic Prospecting from the Field Work Experience at Ishimbaievo." See No. 3319 of this list.

3341. OTUKA, Yanosuke, "The Earthquake of Central Taiwan (Formosa), April 21, 1935. and Earthquake Faults" (Japanese with English abstract), *Bul. Eq. Res. Inst.*, Supp. Vol. 3, 22-74, 23 fig., 4 pl., bib., Tokyo, Mar., 1936.

3342. PARTRIDGE, G. F., "The Measurement of Small Amplitudes of Vibration," *Phil. Mag.*, No. 136, Vol. 20, 953-963, London, Nov., 1935.

3343. PASSARGE, H., "Abplattung und Masse der Erde," *Ger. Bei.*, Bd. 48, Heft 1, 81-83, Leipzig, 1936.

— RAPPLEYE, H. S., and REYNOLDS, W. F., "Geodetic Work in Earthquake Regions in California." See No. 3303 of this list.

— REYNOLDS, W. F., and RAPPLEYE, H. S., "Geodetic Work in Earthquake Regions in California." See No. 3303 of this list.

3344. RIEBER, Frank, "Visual Presentation of Elastic Wave Patterns under Various Structural Conditions," *Geophysics*, Vol. 1, No. 2, 196-218, 24 fig., Tulsa, July, 1936.

The author's abstract reads: "The usual form of reflection seismograph operates satisfactorily over simple structural conditions, but frequently fails to obtain part or all of the desired information when structures are steeply folded, faulted or otherwise complicated. The reasons for this are plainly evident if the paths of the waves in the earth can be visualized. This has been done by the use of a technic originally developed for acoustical measurements.

A miniature explosion radiates waves into various models of structure, where reflection and diffraction take place in the same manner as in the earth. The various moving waves are actually photographed in flight. A series of plates is presented, showing wave patterns in various types of structures, ranging from simple to complex. New types of equipment and technic are briefly described, with which exploration may be carried into the more complex structural regions successfully."

3345. RONCALI, G., "Sulle notazioni delle onde sismiche," *Bol. Soc. Sis. Ital.*, Vol. 34, No. 3-4, 134-151, bib., Rome, 1936.

3346. ROSS, S. H., "Earthquakes," *Technique*, Vol. 8: No. 8, 346-350; No. 9, 427-430, 438; No. 10, 465-468, 477; Montreal, Oct., Nov., and Dec., 1933.

The above is a well-written popular presentation of the subject. W.W.D.

3347. ROTHÉ, E., *et al.*, "Annuaire de l'Institut de Physique du Globe, 1934," *Pub. Univ. Strasbourg*, 127 pp., Strasbourg, 1936.

In addition to the usual reports of the stations under the control of the University, the publication contains short addenda by J. Lacoste on Microseisms and by Mme. Hée on the earthquake of Dec. 7, 1934, in Algeria.

— RUGE, Arthur C., "Progress in Engineering-seismology Research at the Massachusetts Institute of Technology" (abstract). See pp. 83-84 of the *Trans. A.G.U.*, reported as No. 3269 of this list.

- RUTHERFORD, H. M., "Reflection Dip-shooting Methods in Seismic Prospecting." See pp. 96-100 (1 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- RUTHERFORD, H. M., EWING, Maurice, and CRARY, A. P., "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain: Part I—Methods and Results" (abstract). See No. 3289 of this list. Part II of this paper is listed under Miller.
3348. SAITA, Tokitaro, "On the Earthquake Damages and the Ground in Taiwan (Formosa)" (Japanese with English abstract), *Bul. Eq. Res. Inst.*, Supp. Vol. 3, 96-105, 10 fig., 3 tab., Tokyo, Mar., 1936.
3349. SCHABAUER, Galen B., "Effect of Humidity in Hotwire Anemometry," *Bur. Stand. Jour. Res.*, Vol. 15, No. 6, 575-578, Washington, 1935.
3350. SCIENCE NEWS-LETTER. The following notes of interest to seismologists appear in recent issues of Vol. 30 of the above publication (Washington, 1936):
- (1) "Earthquake is Recorded Near the Philippines," No. 797, p. 44, July 18.
  - (2) "Chilean Quake Recorded at Eighteen Observatories," No. 798, p. 56, July 25.
  - (3) "Quake Center Located Near Walla Walla," *Ibid.*, p. 62.
  - (4) "New Quake Strikes the Coast of Chile," No. 800, p. 89, Aug. 8.
  - (5) "First Earthquake Recorder to be Placed in Museum," No. 801, p. 103, Aug. 15.  
This refers to a Ewing seismograph—the first instrument of this kind to record in the United States.
  - (6) "4,000 Earthquakes a Year is Average for Japan," No. 803, p. 139, Aug. 29.
  - (7) "Earthquake's Record Lost in Hurricane Disturbance," No. 808, p. 211, Oct. 3.
  - (8) "Earthquake off Oregon Recorded on Seismographs," No. 809, p. 232, Oct. 10.
  - (9) "Venice Earthquake not Really a 'World-Shaker'," No. 812, pp. 277-278, Oct. 31.
  - (10) "Earthquake Center Was North of Matanuska," *Ibid.*, p. 280.
  - (11) "Quake off Japanese Coast on Our Election Day," No. 814, p. 313, Nov. 14.
  - (12) "Kamtchatka Coast Shaken by Friday 13th Earthquake," No. 815, p. 325, Nov. 21.
3351. SCOTT, Harold W., "The Montana Earthquakes of 1935," State of Montana, Bureau of Mines and Geology, Memoir No. 16, 47 pp., 9 pl., 6 tab., Montana School of Mines, Butte, Montana, 1936. W.H.C. + R.R.B.
3352. SEWELL, R. B. Seymour, "Geophysics of the Indo-Pacific Region," *Nature*, No. 3489, 419-420, London, Sept. 12, 1936.

The above indicates a review of the publication "Geographie des Indischen und Stillen Ozeans: Im Auftrage der Deutschen Seewarte verfasst von Prof. Dr. Gerhard Schott." Published by C. Boysen, pp. xx+413, 38 pl. Price 36 gold marks. Hamburg, 1935.

- SHARPE, J. A., and LEITH, Andrew, "Deep-focus Earthquakes and the Strength of the Earth" (abstract). See No. 3289 of this list.
- SHEPARD, Francis P., "Changes of Sea Level as the Cause of Submarine Canyons," "New Discoveries from the California Submarine Canyons," and "Northward Continuation of the San Andreas Fault" (abstracts). See No. 3289 of this list.
3353. SKRINE, C. P., "The Quetta Earthquake," *Geog. Jour.*, Vol. 88, No. 5, 414-430, 10 fig., bib., London, Nov., 1936.
- An excellent description of the earthquake by one who is evidently a good observer and also able to give a vivid description of what he has observed.
- SLICHTER, L. B., "Progress-report on a Three-component Seismometer and Tiltmeter" (abstract). See p. 76 of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- SMITH, G. H., and JOHNSON, N. G., "Explosives for Seismic Prospecting." See No. 3313 of this list.
3354. SOCIETY OF PETROLEUM GEOLOGISTS, "Publications of the Society of Petroleum Geologists," *Geophysics*, Vol. 1, No. 2, 279-280, Tulsa, July, 1936.
- The list gives the publications to date which have been issued by the above Society.
- SOHON, F. W., S.J., "Transforming the Stereographic Map." See pp. 100-101 (6 fig.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.
3355. SOMVILLE, O., and AGAMENNONE, G., "Eugene Lagrange" (an obituary), *Bol. Soc. Sis. Ital.*, Vol. 34, No. 3-4, 156-157, Rome, 1936.
- Prof. Lagrange died at Brussels on June 15, 1936. In addition to his work in astronomy, he was interested in seismology and was instrumental in establishing the seismological station at Ucele. The above obituary is in French as written by Somville, and in Italian as written by Agamennone.
- STECHSCHULTE, V. C., S.J., "Geological Implications of Deep-focus Earthquakes." See pp. 81-83 of the *Trans. A.G.U.*, reported as No. 3269 of this list.
- STETSON, H. C., "Age of the Submarine Valleys off the Central Atlantic Coast" (abstract). See No. 3289 of this list.
3356. SUZUKI, Takeo, "Earthquake Resistivity of Native Formosan Houses of 'Dokaku' Construction" (Japanese with English abstract), *Bul. Eq. Res. Inst.*, Supp. Vol. 3, 110-119, 4 fig., 3 tab., Tokyo, Mar., 1936.
3357. SYONO, S., "On the Waves Caused by a Sudden Deformation of a Finite Portion of the Bottom of a Sea of Uniform Depth," *Geoph. Mag.*, Vol. 10, No. 1, 21-41, 8 fig., Tokyo, Aug., 1936.



## 3358. TAKAHASI, Ryutaro,

- (1) "Intensity Distribution of the Formosa Earthquake of April 21, 1935, and the Strength of Dokaku Structures" (Japanese with English abstract), *Bul. Eq. Res. Inst., Supp.* Vol. 3, 120-140, 12 fig., 10 tab., Tokyo, Mar., 1936.
- (2) "On the Sinuous Buckling of Rails," *Ibid.*, 148-153, 4 fig.

3359. TAYLOR, ROCHESTER, "Earthquake Research under Way," *Taylor, Rochester*, p. 138, Rochester, Third Quarter, 1936.

The publication is the organ of Taylor Inst. Co. The article describes some of the activities of the organizations of the United States engaged in seismological research. On page 140 of the same issue is a short note on a seismograph proposed by Benioff for use in regions subject to severe local earthquakes.

— THOM, W. T., Jr., "Deep-focus Earthquakes from a Geologist's Point of View." See pp. 108-111 (bib.) of the *Trans. A.G.U.*, reported as No. 3269 of this list.

3360. THRUPP, Edgar C., "Earthquake Prediction," *Eng. Jour.* (Organ of the Engineering Institute of Canada), Vol. 19, No. 8, 387-388, Montreal, Aug., 1936.

The above refers to a letter to the editor in which the author claims to have succeeded in solving many problems of physical science which have never been understood before. One of these is the cause of earthquakes and the times of their occurrence. The author states: "The cause has been definitely found and the approximate dates of major events can be predicted at any time in advance." He then predicts a series of disturbances "within ten days before or after a stress peak on November 1 (1936)." The place, or places, where these will occur are not mentioned. J.A.P.

3361. THYSSEN, St. von, "Über die Verwendung verschiedenartiger Explosionen zur Erregung seismischer Wellen," *Zeit. Geoph.*, Jahr. 12, Heft 2-3, 86-97, 8 fig., bib., Braunschweig, 1936.

## 3362. TYDEMAN, G. E., "Notes on Phenomena of a Geophysical Nature," E. J. Brill, pub. 146 pp., 14 fig., 5 tab. Price F. 2.50. Leiden, 1936.

The table of contents is as follows: Preface; Summary; Chap. I, Introduction; Chap. II, The tidal forces (Appendix); Chap. III, The tides of the atmosphere; Chap. IV, The tides of the ocean; Chap. V, Glacial periods and mountain building; Chap. VI, The earth's rotation; Chap. VII, The Secular changes of the ocean level; Chap. VIII, The tides of the earth's main mass; Appendix.

The treatise is an exposition of the author's contention that "prevailing theory of tidal forces during two centuries has been an incomplete dogma, suffering from a great error." This error has been the neglect of what the author terms "Tangential forces." Among other phenomena which he says demonstrate the existence of these forces and their effects the author cites: The variation in latitude and (partially) earthquakes and microseismic tremors. E.J.B. + J.F.S.

— ULRICH, F. P., "Field Parties and Problems," and (with N. H. Heck and H. E. McComb) "Strong-motion Program and Tiltmeters." See No. 3303 of this list.

3363. VANNUCCHI, P. Onorio, "Primo quinquennio di vita dell'Osservatorio sismologico di S. Domenico di Prato," *Bol. Soc. Sis. Ital.*, Vol. 34, No. 3-4, 152-155, Rome, 1936.

3364. WAESCHE, H. H., "Notes on Japanese Volcanology and on Seismological Research," *Volcano Letter*, No. 436, 4-8, Hawaii, June, 1936.

An interesting and informative article devoted mostly to the work on volcanology but also presenting much of interest to seismologists.

3365. WEATHERBY, B. B., "The Organization of an Effective Exploration Department," *Geophysics*, Vol. 1, No. 2, 179-188, 1 fig., Tulsa, July, 1936.

3366. WEBB, Robert W., "Kern Canyon Fault, Southern Sierra Nevada," *Jour. Geol.*, Vol. 44, No. 5, 631-638, 1 fig., bib., Chicago, July-Aug., 1936.

3367. WILLIAMS, N., "Present Rate of Gulf Coast Exploration May Find all Reserves in Two Years," *Oil and Gas Jour.*, Vol. 34, No. 21, 11-12, Tulsa, 1935.

— WILLIS, Bailey, "African Plateaus and Rift Valleys," and "Rift Valley Types" (abstracts). See No. 3289 of this list.

3368. WILSON, John H., "A Proposed Geophysical Program of Exploration for Nebraska and the Dakotas," *Geophysics*, Vol. 1, No. 2, 189-195, 1 map, 1 tab., Tulsa, July, 1936.

See also the abstract of the author's paper on "A Recommended Program for the Exploration of the Great Plains," *Ibid.*, p. 290.

3369. WINGATE, Edward G., "What May be Learned From Tilt," *Volcano Letter*, No. 432, 6-7, Hawaii, Feb., 1936.

Refers particularly to conditions in vicinity of volcano.

3370. ZANON, Francesco Saverio, "I cicloni dell'Atlantico settentrionale e i microsismi a Venezia," *Bol. Soc. Sis. Ital.*, Vol. 34, No. 3-4, 116-133, bib., Rome, 1936.

This is the concluding section of the paper. The first section was reported as No. 3266 of these lists.

## LIST OF COLLABORATORS

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

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## SUBJECT INDEX FOR THE YEAR 1936

The following subject index for the items listed in the *Bibliography of Seismology* for the year 1936 has been prepared in the same form as that for the items listed in 1935 (see pp. 175-178, Vol. XII, No. 8, of these *Publications*) and may be considered a continuation of that index.

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- A2. Air; Sound Vibrations in: Nos. 2962, 3066 (10), 3253, 3284 (7).
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- C3. Cosmogony; Theoretical Discussions of Similar Nature; Continental Drift, etc.: Nos. 2946, 3258, 3283, 3296 (2), 3343, 3362.
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- R2.1 Reviews of Various Phases of Seismology: Nos. 2957, 2966, 2987, 3006, 3128.
- S1. Scales, Earthquake: Nos. 3074, 3280.
- S2. Seismicity of Particular Regions: Nos. 2959, 2990 (2), 2990 (7), 2990 (8), 3042 (1), 3059, 3256, 3329, 3332 (1), 3350 (6).  
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- S3. Seismic Prospecting: Nos. 2947, 2958, 2961, 2965, 2968, 2980, 2982, 2986, 2991, 2998 (5), 2998 (10), 3001, 3002, 3008, 3015, 3025, 3037, 3044, 3046, 3066 (9), 3073, 3078, 3082, 3087, 3089, 3091, 3092, 3097, 3099, 3101, 3107, 3111, 3115, 3120, 3124, 3131, 3143, 3147, 3151, 3154, 3163, 3165, 3172, 3173, 3175, 3202, 3212 (2), 3222, 3224, 3227, 3233, 3239, 3251, 3263, 3279, 3296 (1), 3307, 3311, 3313, 3319, 3322, 3334, 3344, 3352, 3365, 3367, 3368.  
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- W1.1 Studies of the World-wide Records of a Single Earthquake: No. 3158.
- W1.2 Seismological Studies of Earth Crustal Structure: Nos. 2976 (1), 3073, 3123, 3188 (2), 3200, 3296 (2), 3326.
- W1.3 Seismological Studies of Deep Structure of the Earth; Velocity-Depth Curves: Nos. 3061 (2), 3134, 3149, 3192, 3316, 3326.

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# Bibliography of Seismology

January, February, March, 1937

3371. BASTINGS, L., "Some Seismological Aspects of the Buller Earthquake," *N.Z.J. Sc. Tech.*, Vol. 18, No. 4, 396-409, 2 fig., 9 tab., bib., Wellington, 1936. R.R.B. + L.B.

This is the second paper on this subject by the same author. It has the sub-title: "Part II.—The P-Waves in the Distant Hemisphere." Part I, dealing with records in the nearer hemisphere, was reported as No. 2011 of these lists.

3372. BEITRÄGE ZUR ANGEWANDTEN GEOPHYSIK, "In memoriam Conrad Schlumberger," *Bei. Angew. Geoph.*, Bd. 6, Heft 2, 123-124, Leipzig, 1936.

The obituary is in French and is preceded by a reproduction from a photograph of Schlumberger.

3373. BELLAMY, Ethel F., "Index Catalogue of Epicentres for 1913-1930," County Press, 36 pp., 3 pl., Newport, Isle of Wight, 1936.

The paper is a geographical index to the *International Seismological Summary*, for the years indicated. The epicentre positions are listed in four divisions according to increasing latitude as:  $\phi = N, \lambda = E$ ;  $\phi = N, \lambda = W$ ;  $\phi = S, \lambda = E$ ;  $\phi = S, \lambda = W$ . The positions are also shown plotted on a Mollweide Equal Area Projection map of the world. A very valuable appendix to the paper is the list of corrected epicentre positions. Where, with new data, it is possible to obtain a closer approximation to the epicentre of an earthquake, the re-determination is sometimes made and printed in later issues of the *Summary*. Users of the publication may easily employ the earlier values and fail to note the corrected ones. In one list of 77 entries all such changes and all errors due to printing are collected in chronological order. Knowing of such a list, users of the *Summary* for the years 1913-1930 should be able to avoid the incorrect data. The Index has evidently entailed a great deal of work on the part of the one best able to prepare it. Her colleagues in all parts of the world owe her a debt of gratitude.

3374. BIRCH, Francis, and Dow, Richard B., "Compressibility of Rocks and Glasses at High Temperatures and Pressures: Seismological Application," *Bul. Geol. Soc. Am.*, Vol. 47, 1235-1256, 4 fig., bib., New York, Aug. 31, 1936.

The above is Paper No. 21, published under the auspices of the Committee on Geophysical Research and the Division of Geological Sciences at Harvard University.  
D.G.S.H.U.

3375. BLUM, Victor J., S.J., "The Intermediate Earthquake of June 24, 1935," *Bul. S.S.A.*, Vol. 26, No. 3, 195-196, 1 fig., bib., Berkeley, July, 1936.

3376. BODLE, Ralph R., "Earthquake Notes," Vol. 8, Nos. 1 and 2, 75-116, Washington, 1936.

This issue is reprinted from the *Transactions of the American Geophysical Union*, reporting the joint meeting of that organization with the Eastern Section of the Seismological Society of America. For the papers presented see No. 3269 of these lists.

R.R.B.

3377. BODLE, Ralph R., "Earthquake Notes," Vol. 8, No. 3, 12 pp., 1 tab., Washington, Dec., 1936.

The issue contains short notes on various subjects of interest to seismologists among which are the following as indicated by headings: Prospectus; First seismograph in the United States; Engineering experiment station bulletin; International meetings; Commission on continental and oceanic structure; Catalog of earthquake epicentres; Seismology in New Zealand; Dynamic distortions in structures subjected to sudden earth shock; Japanese earthquakes; Amateur seismological league; Data needed for design purposes; Faults of Panama region; Seismology in Washington State; New strong-motion stations; Teleseismic stations; Seismic forces and the San Francisco-Oakland Bay bridge; Cisterns for fire fighting after earthquakes; Earthquake-proof earth dams; Designing bridge towers 708 feet high; Accelerograph at Texas Exposition; Boger, Texas, shock of June 19, 1936; Epicentres; Building vibration work; Publications by members of the Eastern Section; Lectures by Section members; Gravity expedition; Rules and Regulations adopted for the Eastern Section; Casualties and damage in principal earthquakes of the United States.

3378. BOIS, Charles, "Sur l'importance des ondes longues et la profondeur du foyer des tremblements de terre," *C.R.*, Tome 203, No. 19, 948-949, bib., Paris, Nov. 9, 1936.

3379. BRYAN, A. B., "True Ground Motion from Mechanical Seismograph Records," *Geophysics*, Vol. 1, No. 3, 340-346, 4 fig., Houston, Oct., 1936.

The author's abstract reads: "Records of several types of ground motion are obtained with two vertical mechanical seismographs of widely different characteristics, mounted on the same base and recorded on the same moving photographic paper. Companion records obtained are shown in one case to yield substantially the same calculated ground motion although the original records are very dissimilar." R.R.B.

- BURIOT-DARSILES, H., "La constitution interne de la terre" (a translation). See No. 3431 of this list.

3380. BYERLY, Perry, and WILSON, James T., "Northern California Earthquakes, April 1, 1934, to December 31, 1935," *Bul. S.S.A.*, Vol. 26, No. 3, 207-213, 1 fig., 2 tab., Berkeley, July, 1936.

3381. CALOI, P., "Studio microsismico del terremoto delle Prealpi Carniche dell'8 giugno 1934," *Bollettino del Comitato per la Geodesia e la Geofisica del Consiglio Nazionale delle Ricerche*, Series 2, Anno 5, No. 4, 209-234, 5 fig., bib., Oct., 1935.

3382. CARDER, Dean S., "Observed Vibrations of Buildings," *Bul. S.S.A.*, Vol. 26, No. 3, 245-277, 25 fig., bib., Berkeley, July, 1936.

3383. CHANT, C. A., "Earthquake Prediction," *Jour. Roy. Ast. Soc. Can.*, No. 260, Vol. 31, 54-55, Toronto, Jan., 1937.

The short note reports a list of earthquakes submitted by E. C. Thrupp of Vancouver in support of his prediction that there would be a peak of seismic stress within ten days of Nov. 1, 1936. See No. 3360 of these lists. Of the eight earthquakes listed, three were not recorded at all on the seismographs at Ottawa. Of the remaining five only one was of major importance. E.A.H.

3384. CHARLESWORTH, J. Kaye, "Geomorphology of the Irish Sea Basin," *Nature*, No. 3503, Vol. 138, 1040-1041, London, Dec. 19, 1936.

3385. CLEMENTS, Thomas, "Experiments on the Fall of Columns," *Bul. S.S.A.*, Vol. 26, No. 3, 229-234, 2 fig., 1 tab., Berkeley, July, 1936.

3386. COMRIE, L. J.,

(1) "Inverse Interpolation and Scientific Applications of the National Accounting Machine," *Supp. Jour. Roy. Statis. Soc.*, Vol. 3, No. 2, 87-114, London, 1936. L.J.C.

(2) "Scientific Computing Service," Circular of 6 pp., bib., London, 1937. L.J.C.

The first paper is listed because of the possible application of the machine described for use in interpolation work. In the second paper Dr. Comrie outlines the service in computing which he is offering. The paper is concluded with a list of 20 publications on the use of calculating machines. E.A.H.

3387. CONRAD, V., "Erdbeben und Luftdruckänderung," *Ger. Bei.*, Bd. 48, Heft 2-3, 239-253, 2 fig., Leipzig, 1936.

See also the paper by Nopcsa reported as No. 3443 of this list.

3388. DAVISON, Charles, "Great Earthquakes," Murby and Co., 286 pp., 12 pl., 97 fig. Price 17s. 6d. London, 1936. E.T.

A lengthy review, signed H. J., appears on pp. 556-557 of the *Geological Magazine*, No. 870, Vol. 73, London, Dec., 1936. The book deals with sixteen great earthquakes, from the one at Lisbon in 1755 to that at Hawke's Bay in 1931. F.D.H. + E.T.

3389. DEUTSCHEN GEOPHYSIKALISCHEN GESELLSCHAFT, "Tagung der Deutschen Geophysikalischen Gesellschaft," *Zeit. Geoph.*, Jahr. 12, Heft 5-6, 273-275, Braunschweig, 1936.

Lists the proceedings of the meetings held at Berlin, Oct. 7-10, 1936.

— Dow, Richard B., and BIRCH, Francis, "Compressibility of Rocks and Glasses at High Temperatures and Pressures: Seismological Application." See No. 3374 of this list.

3390. DYK, Karl, "The California Earthquake of April 15, 1928," *Bul. S.S.A.*, Vol. 26, No. 3, 239-244, 1 fig., 1 tab., Berkeley, July, 1936.

3391. EARTHQUAKE RESEARCH INSTITUTE,

(1) "Relative Vertical Displacements of Bench-marks Along the Lines of Levels from Hukuroi to Okitu, from Okitu to Odawara, and from Okitu to Kohu," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 481-485, 3 fig., Tokyo, Sept., 1936.

(2) "Relative Vertical Displacements of Bench-marks Along the Line of Levels from Yugawara to Zyoto-mura on the East Coast of the Idu Peninsula," *Ibid.*, 486-488, 1 fig.

Each of these papers is in Japanese with a *résumé* in English.

— EWING, Maurice, "Frequency of Water Waves." See No. 3463 of this list.



3392. FUCHIDA, Takato, "An Experimental Method to Solve the Equation of Motion of the Seismograph," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 415-419, 6 fig., Tokyo, Sept., 1936.
3393. GIBBS, Reginald E., and TSIEN, Ling-Chao, "The Production of Piezoelectricity by Torsion," *Phil. Mag.*, No. 146, Vol. 22, 311-322, 6 fig., bib., London, Aug., 1936.
- GOLDTHWAIT, James W., and LYON, Charles J., "An Attempt to Cross-date Trees in Drowned Forests." See No. 3428 of this list.
3394. GOLDTHWAIT, Richard P., "The Damariscotta Shell Heaps and Coastal Stability," *Am. Jour. Sc.*, Vol. 30, 1-13, 3 fig., 1 pl., bib., July, 1935. R.P.G.
3395. GUNN, ROSS, "On the Origin of the Continents and Their Motions," *Jour. Frank. Inst.*, Vol. 222, No. 4, 475-492, bib., Philadelphia, Oct., 1936.
3396. GUTENBERG, B., "On Some Problems Concerning the Seismic Field Methods," *Bei. Angew. Geoph.*, Bd. 6, Heft 2, 125-140, 5 fig., bib., Leipzig, 1936.
3397. GUTENBERG, B., and RICHTER, C. F., "Materials for the Study of Deep-focus Earthquakes," *Bul. S.S.A.*, Vol. 26, No. 4, 341-390, 1 fig., 53 tab., bib., Berkeley, Oct., 1936.
- The article includes a graph (28" x 19") of the travel times for the various phases of an earthquake with a focal depth of 400 km.
3398. HAGIWARA, Takahiro, "Observation of the Predominating Periods in the Earthquake Motions at Daiho-mura and Kamiotu-mura, Ibaraki Prefecture," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 599-603, 4 fig., bib., Tokyo, Dec., 1936.
- In Japanese with a short *résumé* in English.
- HAGIWARA, Takahiro, OMOTE, Syun-itiro, and NASU, Nobuji, "Studies on Earthquakes in the Kwanto District: Part I." See No. 3438 of this list.
- HAGIWARA, Takahiro, OMOTE, Syun-itiro, and NASU, Nobuji, "Studies on the Propagation of the Artificial Earthquake Waves through Superficial Soil or Sand Layers and the Elasticity of Soil and Sand." See No. 3439 of this list.
3399. HAYES, R. C., "Dominion Observatory (N.Z.): Report on the Activities of the Observatory during the Year Ended 31st December, 1935," *Dom. Obs. (N.Z.) Bul.*, No. 112, 7 pp., 1 map, tab., Wellington, 1936. R.C.H.
3400. HECK, N. H., "The Earthquake Problem," *Scientia*, No. 293-9, Vol. 60, 136-142, bib., Bologna, 1936. N.H.H.
3401. HERMANN et Cie, "Géologie et paléontologie" (a bibliography), 240 pp., Paris, 1936.

The above bibliography contains one section on volcanism and seismology (Sec. I, pp. 69-75). In this section appear the names of some modern authors whose publications have already been listed in this *Bibliography of Seismology*. There are, however, other publications listed which appeared some years ago and which are not entered in these lists. The actual papers, most of them very difficult to obtain, are offered by Hermann and Co., 6, Rue de la Sorbonne, Paris, France, at prices which vary from 8 or 10 to 100 francs.

3402. HERRMANN, H., STÖCKE, K., and UDLUFT, H., "Ground Pressure and Plate-statics Tests on the Elastic Properties of Coal-measure Rocks from Upper-Silesian Mines," *Bei. Angew. Geoph.*, Bd. 6, Heft 2, 206-240, 43 fig., Leipzig, 1936.

This is the second part of the paper. The first part was reported as No. 3079 of these lists.

3403. HIDAHA, K., "Numerical Solution of Fredholm's Integral Equation with a Kernel whose Derivative is Discontinuous," *Geoph. Mag.*, Vol. 10, No. 2, 269-274, 2 fig., Tokyo, Sept., 1936.

3404. HILLER, Wilhelm, "Das Oberschwäbische Erdbeben am 27. Juni 1935," *Württembergische Jahrbücher für Statistik und Landeskunde*, 1934-1935, 209-226, 11 fig., 4 tab., 2 pl., Stuttgart, 1936. W.H.

The paper is divided into three sections. The first deals with the subject: "Die makroseismischen Wirkungen des Erdbebens." Eleven reproductions from photographs, showing damage sustained by various buildings in the epicentral area, illustrate this section. The second section bears the title: "Bearbeitung der instrumentellen Aufzeichnungen." In this connection the author tabulates the instrumental data and deduces the position of the epicentre and the depth of focus. The final section treats of the aftershocks. A large scale map of the epicentral area is added as a plate, supplementing the isoseismal map of the text.

3405. HILLER, Wilhelm, "Seismische Berichte der Württembergischen Erdbebenwarten," *Jahrgang 1935*, 86 pp., 9 fig., Stuttgart, 1936.

The report is divided into two sections—the usual report of earthquake phases, and the appendix (of 23 pp.) describing in greater detail some of the more important earthquakes. Besides the central station records at Stuttgart, the report deals with the data from the subsidiary stations at Ravensburg and Messstetten. The detailed descriptions are concerned with earthquakes which had their epicentres in southwest Germany.

W.H.

- HOLLISTER, J. S., and REED, R. D., "Structural Evolution in Southern California." See No. 3448 of this list.

- HUGHES, J. S., "The International Seismological Summary" (a report on this subject). See No. 3475 of this list.

3406. IDE, John M., "An Experimental Study of the Elastic Properties of Rocks," *Geophysics*, Vol. 1, No. 3, 347-352, 2 tab., bib., Houston, Oct., 1936.

The author's abstract reads: "Laboratory determinations of Young's modulus, rigidity, and compressibility were made on a set of representative rock samples. These measurements are compared with the theoretical relations between the elastic constants of an isotropic medium. Computed longitudinal and transverse wave velocities are compared with direct field measurements by Leet in granite and norite. Agreement is within 5 per cent for norite, and 20 per cent for granite." R.R.B.

3407. IDE, John M., "The Elastic Properties of Rocks: A Correlation of Theory and Experiment," *Proc. Nat. Acad. Sc.*, Vol. 22, No. 8, 482-496, 1 fig., 3 tab., bib., Washington, Aug., 1936.

The above is Paper No. 30, published under the auspices of the Committee on Geophysical Research at Harvard University. D.G.S.H.U.

— IDA, Kumizi, and ISHIMOTO, Mishio,

- (1) "Expériences sur le sol."
- (2) "Determination of Elastic Constants of Soils by Means of Vibration Methods. Part I. Young's Modulus." See No. 3410 of this list.

3408. INOUE, Win, "Notes on the Origins of Earthquakes," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 582-598, 8 fig., bib., Tokyo, Dec., 1936.

3409. ISHIMOTO, Mishio, "Études statistiques sur les séismes observés à Tôkyô depuis 1876," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 610-615, 3 fig., Tokyo, Dec., 1936.

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

3410. ISHIMOTO, Mishio, and IDA, Kumizi,

- (1) "Expériences sur le sol," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 534-542, 11 fig., 2 tab., bib., Tokyo, Dec., 1936.
- (2) "Determination of Elastic Constants of Soils by Means of Vibration Methods. Part I. Young's Modulus," *Ibid.*, 632-656, 30 fig., 8 tab., bib.

The first paper is in Japanese with a short *résumé* in French; the second is in English with a short *résumé* in Japanese.

3411. JACKSON, Dugald C., "Japanese Higher Education and Research in the Physical Sciences," *Science*, No. 2174, Vol. 84, 189-192, New York, Aug. 28, 1936.

3412. JEFFREYS, Harold, "On the Figures of the Earth and Moon," *M.N., R.A.S.*, Vol. 97, No. 1, 3-15, bib., London, Nov., 1936.

— JEFFREYS, Harold, "Transmission Times." See No. 3475 of this list.

3413. JONGMANS, W. J., "Geologische onderzoekingen voor de Nederlandsche Spoorwegen in Limburg in verhand met bodemaafschuivingen (Geological researches for the Dutch railways in the Province of Limburg, in connection with earth slides)," *Spoor- en Tramwegen*, Vol. 4, Nos. 3-6, 62-66, 88-89, 112-114, 145-147, The Hague, Aug.-Sept., 1931.

A review appears in *Geol. Zentralblatt*, Vol. 47, No. 2, 108-109, Berlin, June, 1932. The paper contains communications as to the earth slides of Nov., 1864, Sept. 25, 1892, and those of 1926-1927, for the region indicated. See also the papers by Klink and by Kengen, reported as Nos. 3418 and 3416, respectively, of this list. J.F.S.

— KANAI, Kiyoshi, and SEZAWA, Katsutada,

- (1) "Damping in Seismic Vibrations of a Surface Layer Due to an Obliquely Incident Disturbance."
- (2) "Dissipation Waves Accompanying Forced Seiches in a Bay."
- (3) "The Effect of Stiffness of Floors on the Horizontal Vibrations of a Framed Structure."
- (4) "Energy Dissipation in Seismic Vibrations of Actual Buildings Predicted by Means of an Improved Theory." See No. 3459 of this list.

- KANAI, Kiyoshi, and SEZAWA, Katsutada,
- (1) "Polarization of Elastic Waves Generated from a Plane Source,"
  - (2) "Energy Dissipation in Seismic Vibrations on an Eight-storied Structure,"
  - (3) "On the Seismic Vibrations of a Gozyunoto (Pagoda)."  
See No. 3460 of this list.
3414. KAWASUMI, Hiroshi, "Theoretical and Experimental Study of Initial Motion of Seismographs and the Quantitative Study of First Impulsion of Earthquake: Part I—Initial Motion of Seismographs Caused by Ground Motion of Shock Type, with Special Reference to a Simple Method of Reducing the First Impulsion of Earthquake Motion," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 319-338, 19 fig., bib., Tokyo, Sept., 1936.
3415. KAWASUMI, Hiroshi, and KINOSITA, Zyun'iti, "Theoretical and Experimental Study of Initial Motion of Seismographs and the Quantitative Study of First Impulsion of Earthquake: Part II—An Experimental Study of the Initial Motion of Seismographs Caused by Motions of Short Duration," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 337-353, 14 fig., 2 tab., Tokyo, Sept., 1936.
3416. KENGEN, A. C., "Uit Geul's verleden. Wetenswaardigheden van de parochie en gemeente Geul (Of the Past of Geul. Interesting Things Regarding the Parish and Community of Geul.—Limburg, Netherlands)," *Anderdaagsche Courant "Het Zuiden,"* 432 pp., Maastricht, 1926.
- Contains references to the earth slides south of Terhagen, Esloo, Nov., 1864, and of Geul, Sept. 25, 1892 (pp. 18-19). See also the publications by Jongmans and by Klink, reported as Nos. 3413 and 3418, respectively, of this list. J.F.S.
- KIDDER, Arthur D., "Cadastral Surveys." See No. 3463 of this list.
- KINOSITA, Zyun'iti, and KAWASUMI, Hiroshi, "Theoretical and Experimental Study of Initial Motion of Seismographs and the Quantitative Study of First Impulsion of Earthquake: Part II." See No. 3415 of this list.
3417. KISHINOUE, Fuyuhiko, "On the Diurnal Periodicity of Felt Earthquakes," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 604-609, 4 fig., 4 tab., bib., Tokyo, Dec., 1936.
3418. KLINK, D. J., "Grondverschuiving nabij Elsloo, Limb. (Earth slide near Elsloo, Limburg)," *De Ingenieur*, Vol. 42, No. 17, 352-353, Gravenhage, April, 1927.
- An abstract appears in *Geol. Zentralblatt*, Vol. 37, No. 7, p. 336, Berlin, July, 1928. See also the papers by Jongmans and by Kengen, reported as Nos. 3413 and 3416, respectively, of this list. J.F.S.
3419. KLIPSCH, Paul W., "Some Aspects of Multiple Recording in Seismic Prospecting," *Geophysics*, Vol. 1, No. 3, 365-377, 5 fig., bib., Houston, Oct., 1936.
- The author presents data and develops the argument to show that "a large number of geophones per channel is necessary to obtain consistently worthwhile values of gain in signal-to-noise ratio."
3420. KOCH, H. W., and ZELLER, W., "Der Einschwingvorgang bei Erschütterungsmessgeräten," *Zeit. Geoph.*, Jahr. 12, Heft 5-6, 220-228, 6 fig., bib., Braunschweig, 1936.



3421. KOHLSCHÜTTER, E., "Messkarte zur Auflösung sphärischer Dreiecke," Dietrich Reimer, Publisher. Price RM 8. Berlin, 1936.

A review by Heinrich Jung appears on pp. 272-273 of *Zeit. Geoph.*, Jahr. 12, Heft 5-6, Braunschweig, 1936.

3422. KUNO, Hisashi, "On the Displacement of the Tanna Fault since the Pleistocene," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 619-631, 4 fig., bib., Tokyo, Dec., 1936.
3423. LANDSBERG, H., "Remarks on the Diurnal Variation of Earthquake Occurrence with Reference to the Helena, Montana, Swarm," *Bul. S.S.A.*, Vol. 26, No. 3, 235-237. 3 tab., Berkeley, July, 1936.

— LEE, A. W., "The Baffin Bay Earthquake of 1933 November 20." See No. 3475 of this list.

3424. LEE, F. W., THOENEN, J. R., and WINDES, Stephen L., "Earth Vibrations Caused by Quarry Blasting," U.S. Department of the Interior, Bureau of Mines, Inves. Rep. No. 3319, 19 pp., 11 fig., bib., Washington, 1936.

Describes results of a five year program of the U.S. Bureau of Mines in co-operation with a group of quarry companies who offered their quarries for use in field tests and supplied part of the funds used in the development of the seismometers by the Bureau of Mines.

R.R.B. + F.W.L.

3425. LEITH, Andrew, and SHARPE, J. A., "Deep-focus Earthquakes and Their Geological Significance," *Jour. Geol.*, Vol. 44, No. 8, 877-917, Chicago, Nov.-Dec., 1936.

R.R.B.

3426. LUCA MURO, F. P. de, "Posibilidades del metodo sismico en el estudio de las ondas elasticas reflejadas," *Boletin de Informaciones Petroleras*, No. 140, Ano 13, 25-28, 1 fig., bib., Buenos Aires, April, 1936.

3427. LYNCH, J. J., S.J., "The Geographical Distribution of Deep-focus Earthquakes," *Bul. S.S.A.*, Vol. 26, No. 3, 197-199, 1 fig., Berkeley, July, 1936.

3428. LYON, Charles J., and GOLDTHWAIT, James W., "An Attempt to Cross-date Trees in Drowned Forests," *Geog. Rev.*, Vol. 24, No. 4, 605-614, 6 fig., bib., New York, Oct., 1934.

J.W.G.

3429. MACELWANE, James B., S.J., "Earthquakes" (a review), *Bul. S.S.A.*, Vol. 26, No. 4, 395-396, Berkeley, Oct., 1936.

The book reviewed is that by N. H. Heck, reported as No. 3302 of these lists.

3430. MAINKA, Karl, "Einige Ergebnisse der geophysikalischen Gebirgsschlagforschung," *Bei. Angew. Geoph.*, Bd. 6, Heft 2, 241-258, 7 fig., Leipzig, 1936.

K.M.

3431. MALLADRA, A., "La costituzione interna della terra," *Scientia*, No. 291-7, Vol. 60, 22-27, 2 fig., Bologna, 1936.

A translation into French, by H. Buriot-Darsiles, appears on pp. 10-14 of the Supplement section of the same issue of *Scientia*.

3432. McCOMB, H. E., "Selection and Installation and Operation of Seismographs," *U.S. Coast and Geodetic Survey, Special Publications*, No. 206, 42 pp., 37 fig., bib., 4 tab., Washington, 1936.

This publication may be obtained from the Supt. of Documents, Washington, at the nominal price of 10 cents. The author has analysed the problem indicated by the title and has discussed the way in which it should be solved under various circumstances. All types of seismographs are dealt with, for both teleseismic and strong motion installations. Instruments for seismic prospecting are not included. The treatment is valuable and authoritative, resulting from the wide experience of the author with the various types of installation which he describes. E.A.H.

3433. McCOMB, H. E., and WENNER, Frank, "Shaking Table Investigations of Teleseismic Seismometers," *Bul. S.S.A.*, Vol. 26, No. 4, 291-316, 23 fig., Berkeley, Oct., 1936.

— McCOMB, H. E., and WENNER, Frank, "The Galitzin Seismometer: Discrepancies Between the Galitzin Theory and the Performance of a Wilip-Galitzin Seismometer." See No. 3474 of this list.

3434. MITSUI GEOPHYSICAL OBSERVATORY, "*Reports of Geophysical Observations*": No. 1, Apr. 12-Dec. 31, 1933, 4 pp., 1 map, 5 pl.; No. 2, Jan. 1-June 30, 1934, 17 pp., 27 fig., 8 pl.; Susaki, Siduoka-ken, Japan, 1936.

This new series of seismological reports is elaborately printed with reproductions of important seismograms. It is proposed to issue the report twice a year.

3435. MIYABE, Naomi, "On the Degree of Disturbance of the Earth's Crust," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 387-398, 13 fig., 3 tab., bib., Tokyo, Sept., 1936.

3436. MIYABE, Naomi,

- (1) "Preliminary Notes on Experimental Studies on the Plastic Deformation of Soil," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 543-552, 14 fig., 2 tab., bib., Tokyo, Dec., 1936.
- (2) "Experimental Studies on the Deformation of Sand Masses due to Vertical Loads, I," *Ibid.*, 553-559, 10 fig., 3 tab., bib.

3437. NAGATA, Takesi, "Space Distribution of Earthquake Hypocentres in the Kwanto District," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 420-426, 6 fig., Tokyo, Sept., 1936.

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

3438. NASU, Nobuji, HAGIWARA, Takahiro, and OMOTE, Syun-itiro, "Studies on Earthquakes in the Kwanto District: Part I—Three-dimensional Distribution of the Seismic Foci," *Bul. Eq. Res. Inst.*, Vol. 14, Part 3, 427-437, 7 fig., Tokyo, Sept., 1936.

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

3439. NASU, Nobuji, HAGIWARA, Takahiro, and OMOTE, Syun-itiro, "Studies on the Propagation of the Artificial Earthquake Waves through Superficial Soil or Sand Layers and the Elasticity of Soil and Sand," *Bul. Eq. Res. Inst.*, Vol. 14, Part 4, 560-581, 22 fig., 8 tab., Tokyo, Dec., 1936.

In Japanese with a short *résumé* in English.

3440. NATURE. The following items of interest to seismologists have appeared in recent numbers of Vol. 138 of the above periodical (London, 1936), as follows:

- (1) "Recent Earthquakes in California," No. 3500, p. 936, Nov. 28.
- (2) "Temperature Measurements in Oil Wells," No. 3502, pp. 1020-1021, Dec. 12.
- (3) "Distribution of Earthquakes in the Kwanto (Japan) District," No. 3503, p. 1063, Dec. 19.

3441. NATURE. The following items of interest to seismologists have appeared in recent numbers of Vol. 139 of the above periodical (London, 1937), as follows:

- (1) "Salvador Earthquake of December 20," No. 3505, pp. 19-20, Jan. 2.
- (2) "Earthquake in Kent on December 29," No. 3506, pp. 64-65, Jan. 9.
- (3) "Tibet Earthquake of January 7," No. 3507, pp. 106-107, Jan. 16.

3442. NEUMANN, Frank, "United States Earthquakes 1934," *Pub. U.S. Dept. Comm. C.G.S.*, No. 593, 99 pp., 27 fig., Washington, 1936. F.N.

In addition to the regular listing of non-instrumental records of earthquakes in various parts of the United States and its Dependencies, this report gives the results of the strong-motion installations in California and of the tilt-recording equipment in the same State. The publication is well illustrated and is a mine of information regarding seismic activity in the United States for the period indicated. E.A.H.

3443. NOPCSA, Francis Baron, "On Connections Existing between Earthquakes and Atmospheric Pressure," *Bei. Geoph.*, Bd. 48, Heft 2-3, 229-238, 3 fig., bib., Leipzig, 1936.

See also the paper by Conrad reported as No. 3387 of this list.

3444. NOVOTORCEV, V. I. (NOVOTORZEV), "Method of Successive Approximations Applied to the Study of Vibrations of Structures. The Effect of Thicker Knot Parts of Rigid Bents," *Pub. Inst. Séis., Acad. Sc. URSS.*, No. 77, 17 pp., 11 fig., Moscow-Leningrad, 1936. N.V.R.

— OMOTE, Syun-itiro, NASU, Nobuji, and HAGIWARA, Takahiro, "Studies on Earthquakes in the Kwanto District: Part I." See No. 3438 of this list.

— OMOTE, Syun-itiro, NASU, Nobuji, and HAGIWARA, Takahiro, "Studies on the Propagation of the Artificial Earthquake Waves through Superficial Soil or Sand Layers and the Elasticity of Soil and Sand." See No. 3439 of this list.

3445. OXFORD, UNIVERSITY OBSERVATORY, "The International Seismological Summary, 1931, July, August, September," 285-440, Oxford, 1936.

3446. PAINE, Clifford E., "Designing Bridge Towers 700 ft. High," *Eng. N.-R.*, Vol. 117, No. 16, 497-505, 9 fig., New York, Oct. 8, 1936.

The article describes the towers of the Golden Gate suspension bridge recently completed at San Francisco. On page 503 the author discusses earthquake considerations.

3447. PREY, A. "Über die Polfluchtkraft," *Ger. Bei.*, Bd. 48, Heft 4, 349-387, 3 fig., bib., Leipzig, 1936.

— RANSONE, K., and ROSAIRE, E. E., "The Growth of Company Owned Operations in Gulf Coast Geophysical Prospecting since July, 1930." See No. 3450 of this list.

3448. REED, R. D., and HOLLISTER, J. S., "Structural Evolution in Southern California," *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 1, 1529-1682, 1 map., Tulsa, Dec., 1936.

R.R.B.

— RICHTER, C. F., and GUTENBERG, B., "Materials for the Study of Deep-focus Earthquakes." See No. 3397 of this list.

3449. RITZ, C. H., "Geomorphology of Gulf Coast Salt Structures and Its Economic Application," *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 11, 1413-1438, 14 fig., Tulsa, Nov., 1936.

The author's abstract concludes as follows: "Differential upward growth of the salt is believed to be caused by the differential rate of flow of salt into the dome. Under the resultant forces it is believed that the vertical axis of the dome may migrate a distance as great as the radius of the dome. Such migration of the vertical axis is of interest to the geologist primarily because of the effect it may have on the structure of the oil-bearing formations."

3450. ROSAIRE, E. E., and RANSONE, K., "The Growth of Company Owned Operations in Gulf Coast Geophysical Prospecting since July, 1930," *Geophysics*, Vol. 1, No. 3, 306-312, 1 fig., Houston, Oct., 1936.

3451. ROTHÉ, E., "Circular Ishimoto." Circular issued by E. Rothé, Secretary of the Association of Seismology of the International Union of Geodesy and Geophysics, 10 pp., Strasbourg, Oct., 1935.

This circular quotes a letter circulated by Mishio Ishimoto, Director of the Earthquake Research Institute, Tokyo, suggesting that stations amplify their monthly reports with a view to interpretation of the mechanism of an earthquake from its records. The replies of various countries to this proposal are summarized and the whole distributed to facilitate discussion at the Edinburgh meeting.

3452. RUGE, Arthur C., "A Machine for Reproducing Earthquake Motions Direct from a Shadowgraph of the Earthquake," *Bul. S.S.A.*, Vol. 26, No. 3, 201-205, 2 fig., Berkeley, July, 1936.

3453. SCHMERWITZ, Gerhard, "Der Koppelungsfaktor bei galvanometrisch registrierenden Seismographen," *Zeit. Geoph.*, Jahr. 12, Heft 5-6, 206-220, 4 fig., bib., Braunschweig, 1936.

3454. SCIENCE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 84 of the above periodical (New York, 1936):

(1) "The International Union of Geodesy and Geophysics," No. 2178, p. 283, Sept. 25.

A notice regarding the Edinburgh meeting and a list of the delegates expected from the United States.

(2) "The Indian Journal *Current Science*," No. 2186, p. 452, Nov. 20.

(3) "The Exact Shape of the Earth," Supp. p. 8, No. 2187, Nov. 27.



3455. SCIENCE NEWS-LETTER. The following item of interest to seismologists has appeared in a recent issue of Vol. 30 of the above periodical (Washington, 1936): "Roads are not all Asphalt," No. 818, 378-380, 2 fig., Dec. 12.

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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.

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Brill, E. J., Publisher, Leiden, Holland.	E.J.B.
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3587. FALTAS, Fayek, "Konstruktive Ermittlung einer geneigten Schicht aus Laufzeitkurven und Azimutabweichungen," *Neue deutsche Forschungen*, Bd. 128, Abt. *Meteor. und Geoph.*, Bd. 2, 12 fig., tab., 31 pp. Price RM 2.20. Junker und Dünnhaupt, Berlin, 1937.
3588. FARREN, W. R., and WHITE, H. H., "Recent Developments in Explosives for Seismograph Prospecting," *Geophysics*, Vol. 2, No. 2, 114-118, 2 fig., Houston, March, 1937.
3589. FIELD, R. M., and FLEMING, Jno. A., "The Commission on Continental and Oceanic Structure of the International Union of Geodesy and Geophysics," *Science*, No. 2198, Vol. 85, p. 180, New York, Feb. 12, 1937.
- The article is divided into three sections: Historical, Committee Meetings, and Action of the General Assembly on September 24, 1936.
- FJELDSTAD, J. E., and EGEDAL, J., "Observations of Tidal Motions of the Earth's Crust Made at the Geophysical Institute, Bergen." See No. 3584 of this list.
- FLEMING, Jno. A., and FIELD, R. M., "The Commission on Continental and Oceanic Structure of the International Union of Geodesy and Geophysics." See No. 3589 of this list.
3590. FREEMAN, L. I., "The Seismograph an Aid to the Geologist in Arkansas," *Mines Mag.*, Vol. 27, No. 5; 19-21, 37; 4 fig., Golden, May, 1937.
3591. GEOGRAPHICAL JOURNAL. A review, signed R. S., of the book on "Theoretical Seismology," by James B. Macelwane, S.J., reported as No. 3326 of these lists, appears on pp. 82-83 of the above *Journal*, Vol. 90, No. 1, London, July, 1937.
3592. GEOLOGICAL MAGAZINE. Two reviews of interest to seismologists, each signed H. J., appear in No. 877, Vol. 74, of the above periodical (London, June, 1937), as follows:
- (1) "Introduction to Theoretical Seismology," James B. Macelwane, S.J., reported as No. 3326 of these lists.
  - (2) "Earthquakes," N. H. Heck, reported as No. 3302 (2).

3593. GEOPHYSICS. In Vol. 2, No. 2 (Houston, March, 1937), of the above periodical, are given a number of abstracts of recent papers of interest to petroleum geophysicists. Many of these are of direct interest to seismologists. Abstracts of papers by the following authors are listed in this issue of the *Bibliography*: Heck, Shepard, Slichter, Rutherford, Gutenberg, Mott-Smith, Gilmore, Sharpe, Washburn, Scherbatskoy and Neufeld, Salvatori, Hare, and Johnson.

3594. GERLANDS BEITRÄGE ZUR GEOPHSIK, "Sach- und Namen-Register zu Band 1-35, einschliesslich Ergänzungsbänden I-III, und einem Ergänzungsheft, zu Gerlands Beiträge zur Geophysik." Akademische Verlagsgesellschaft, m.b.H., 126 pp., explanatory introduction in German and in English, Leipzig, 1933.

The above lists the entire contents of the 33 volumes indicated. The arrangement, by authors and by subjects, permits ready reference to any of the papers or reviews of papers published from 1887 to the beginning of 1932 in the Beiträge. It is a most valuable reference book. A similar analysis of other periodicals of long standing would be very useful.

3595. GIBSON, J. E., "Marl Tunneling Methods," *Eng. N.-R.*, Vol. 119, No. 2, 60-62, 3 fig., New York, July 3, 1937.

This tunneling was done near Charleston, S.C., and some observations are made as to the effects of the Charleston earthquake on the earth strata.

— GILMORE, Marion H., "Earthquake Investigations" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.

3596. GLENNIE, E. A., "The Depth of the Gangetic and Cuddapah Down-warps in India," *Bei. Angew. Geoph.*, Bd. 6, Heft 3, 311-318, 1 fig., 4 tab., bib., Leipzig, 1937.

3597. GOULATEE, B. L., "Gravity, Geoid, and Plumb-line Deflections in Mountainous Areas," *Indian Acad. Sc., Proc.*, Ser. 5A, 257-268, Bangalore, March, 1937.

An abstract by the author appears as No. 2480, p. 586, *Sc. Abst.*, Sec. A., Vol. 40, No. 474, June 25, 1937.

3598. GREENTREE, C. D., "Vibration-measuring Instruments," *Electrical Engineering*, Vol. 56, No. 6, 706-710, Easton, June, 1937.

"Though this article deals with the problem of vibration measurement from the standpoint of the electrical engineer it is interesting to note the striking similarity to the requirements needed to measure building and ground vibrations in connection with earthquake resistant construction of buildings, etc." R.R.B.

3599. GREENWALD, H. P., "The Physics of Subsidence and Ground Movement in Coal Mines," *Jour. App. Phys.*, Vol. 8, No. 7, 462-469, 7 fig., bib., Lancaster, July, 1937.

3600. GRIME, G., and EATON, J. E., "The Determination of Young's Modulus by Flexural Vibration," *Phil. Mag.*, No. 152, Vol. 23, 96-99, tab., bib., London, Jan., 1937.

3601. GUNN, ROSS, "A Quantitative Study of Mountain Building on an Unsymmetrical Earth," *Jour. Frank. Inst.*, Vol. 224, No. 1, 19-53, 3 fig., bib., Philadelphia, July, 1937.

The principle of isostatic equilibrium of the earth's crust is discussed and restated in a useful form which takes account of superposed vertical stresses.

- GUTENBERG, B., "Geophysics as a Science" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.
3602. HAGIWARA, Takahiro, and OMOTE, Syun'itiro, "The Niizima Earthquake of December 27, 1936," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 559-568, 64 fig., Tokyo, June, 1937.
- The above paper is in Japanese with a brief *résumé* in English. Most of the illustrations are half-tone reproductions from photographs. Unfortunately, the captions of the photographs are given only in Japanese.
3603. HAMMILL, Harold B., "Flat Slabs on 25-ft. Spans in Earthquake-resistant School," *Eng. N.-R.*, Vol. 118, No. 24, 918-919, 1 fig., New York, June 17, 1937.
- HARE, D. G. C., "A New Source of Damped Wave Trains Suitable for the Testing of Geophysical Instruments" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.
3604. HARRIS, F. R., "Causes of Land Subsidence," *Eng. N.-R.*, Vol. 118, No. 23, 858-859, New York, June 10, 1937.
3605. HAWLEY, J. H., "Level Lines at Lake Mead," *Eng. N.-R.*, Vol. 118, No. 23, p. 858, New York, June 10, 1937.
- HECK, N. H., "Seismological Investigations in the Western Mountain Region" (Abstract only of paper delivered before the forty-ninth annual meeting of the Geological Society of America, Dec. 29-31, 1936). See No. 3593 of this list.
3606. HEISKANEN, W., "Über die Isostasiefrage," *Verh. 9. Tag. d. Balt. Geod. Komm. 1936*, 152-163, Helsinki, 1937.
3607. HESS, H. H., "Further Discussion on Submerged Canyons," *Science*, No. 2216, Vol. 85, p. 583, New York, June 18, 1937.
3608. HOLLAND, Sir Thomas, "Permanence of Oceanic Basins and Continental Masses," *Jour. Brit. Ast. Ass.*, Vol. 47, No. 8, 303-304, London, June, 1937.
- A brief report of a lecture, the summary of which is reported in *Nature*, Vol. 139, p. 809, London, May 8, 1937.
- The lecture may be obtained as a separate, in paper covers, at 1 shilling net, from MacMillan and Co. Ltd., London, W.C.2.
- HOLLISTER, J. S., and REED, R. D., "Structural Evolution of Southern California." See No. 3638 of this list.
3609. HUME, G. S., "The Stratigraphy and Oil and Gas Prospects of East-Central Alberta," *Can. Min. and Metal. Bul.*, No. 298, 126-140, 7 fig., bib., Montreal, Feb., 1937.
- The final note in the above article deals with the subject: "Use of Geophysical Methods."
3610. IDA, Kumizi, "Some Experiments on the Shrinkage of Soil," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 544-558, 14 fig., Tokyo, June, 1937.



3611. ISHIMOTO, Mishio, "Observations des périodes prédominantes dans les secousses séismiques dont la distance épacentrale est assez grande," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 536-543, 6 fig., 1 tab., Tokyo, June, 1937.

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

3612. JEFFREYS, Harold, "Table for the Near Earthquake Pulses," Isle of Wight, The County Press, 7 pp., Newport, 1937. H.J.+R.R.B.

3613. JEFFREYS, Harold, "The Ellipticity Correction to the *P* Table," *M.N., Geoph. Supp.*, Vol. 4, No. 2, 165-184, London, May, 1937. E.T.

3614. JEFFREYS, Harold, "On the Relation between Direct and Inverse Methods in Statistics," *Proc. Roy. Soc.*, Ser. A, No. 902, Vol. 160, 325-348, bib., London, June 1, 1937.

— JOHNSON, Curtis H., "Use of the Sonograph in Mapping Faults" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.

3615. JOURNAL OF THE FRANKLIN INSTITUTE, "Artificial Vibration—A New Method of Dynamic Research," *Jour. Frank. Inst.*, Vol. 224, No. 1, p. 102, Philadelphia, July, 1937.

A short note, signed R.H.O., concerning the abstract of an unpublished paper by Rudolph K. Bernhard which appeared in *Civil Engineering*, Vol. 7, No. 4. It deals with the method of inducing vibrations in a structure to be tested, by means of an oscillator at various frequencies of vibration.

3616. KAMEL, Mostafa, "Seismische Bestimmung des Einfallens und Streichens aus Amplituden," *Neue deutsche Forschungen (Abt. Meteor. und Geoph.)*, 29 pp. Junker und Dünnhaupt, Berlin, 1936.

— KANAI, Kiyoshi, and SEZAWA, Katsutada,

- (1) "On the Elastic Deformation of a Stratified Body Subjected to Vertical Surface Loads."

- (2) "The Same Stationary Vibration of an Origin Accompanying Different Types of Disturbance Therefrom."

- (3) "On the Free Vibrations of a Surface Layer Due to an Obliquely Incident Disturbance."

- (4) "Energy Dissipation in the Vibrations of a Bridge. I."

See No. 3653 of this list.

3617. KÖHLER, Karl, "Das Erdbeben in Schlesien im Jahre 1931," *Mitteilungen des Naturwissenschaftlichen Vereines in Troppau (C.S.R.)*, No. 26, 31-33, Troppau, Jan. 1, 1934.

After enumerating earlier earthquakes in the same region, the author describes those of April 11-18, 1931, which had for the strongest shock that of April 12, 2<sup>h</sup> 22<sup>m</sup> p.m. R.Z.

3618. KOLDERUP, Carl Fred., "Jordskjelv i Norge, 1932-1935," *Bergens Museums Arbok 1936, Naturvidenskapelig rekke*, No. 9, 17 pp., 3 fig., 1 pl., Bergen, 1937.

3619. LAMBERT, Walter D., "The Figure of the Earth from Gravity Observations," *Jour. Wash. Acad. Sc.*, Vol. 26, No. 12, 491-506, Dec. 15, 1936.

## 3620. LAMBERT, Walter D.,

- (1) "Report of the Association of Geodesy (of the International Union of Geodesy and Geophysics)," *Science*, No. 2196, Vol. 85, 122-123, New York, Jan. 29, 1937.
- (2) "An Old Answer to a Present-day Problem," *Ibid.*, No. 2221, Vol. 86, 79-80, New York, July 23, 1937.

Discusses the hypothesis of a change in the earth's rate of rotation, proposed by others to account for present-day submerged canyons as caused by a change in oceanic depths due to the change in rate of rotation.

3621. LEITH, Andrew, and SHARPE, J. A., "Deep-focus Earthquakes and Their Geological Significance," *Jour. Geol.*, Vol. 44, No. 8, 877-917, 10 fig., bib., Chicago, Nov.-Dec., 1936.3622. LENOX-COYNGHAM, Sir Gerald, "Montserrat and the West Indian Volcanoes," *Nature*, No. 3526, Vol. 139, 907-910, 4 fig., London, May 29, 1937.

Since early in 1934 Montserrat has been subjected to numerous earthquakes, some of them of destructive violence. The above article describes conditions on the island and the various lines of research which have been or are being carried out to determine the structure of the region and the cause of the earthquakes.

3623. LYNCH, Joseph, S.J., "The Earth's Core," *Science*, No. 2192, Vol. 85, 15-16, New York, Jan. 1, 1937.3624. MACELWANE, James B., S.J., "A Research Library in the Geophysical Field," *Geophysics*, Vol. 2, No. 1, 17-20, Houston, Jan., 1937.3625. MARSHALL, A. J., "Northern New Guinea," *Geog. Jour.*, Vol. 89, No. 6, 489-506, 10 fig., London, June, 1937. R.R.B.

At various points in the article reference is made to the effects of an earthquake which occurred in September, 1935.

## 3626. MARTIN, H.,

- (1) "Die Grundlagen zur Beurteilung von Verkehrerschütterungen," *Zeit. Geoph.*, Jahr. 12, Heft 7-8, 322-338, 8 fig., bib., Braunschweig, 1936.
- (2) "Untersuchungen am Schütteltisch," *Ibid.*, 339-346, 7 fig., bib.

— McDONALD, Gertrude, "Bibliography on Microseisms." See Appendix to this list.

3627. MEINESZ, F. A. Vening, "The Gravity Expedition of Hr. Ms. Submarine 016 in the North Atlantic, January 11-March 16, 1937," *Proc. Koninklijke Akademie van Wetenschappen te Amsterdam*, Vol. 40, No. 5, 382-388, 2 fig., 1 map, tab., Amsterdam, 1937.

— MINIKAMI, Takeshi, and TAKAHASI, Ryutaro, "Tilt Observations during the Recent Activities of Volcano Asama." See No. 3660 of this list.

3628. MONTANDON, Raoul, "L'assurance des dommages causés par les forces de la nature," *Mat. E. Cal.*, No. 38, 143-151, Geneva, 1936.

— MOTT-SMITH, Morton, "Adverse Effects Associated with Variably Compounded Seismic Records" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.

3629. NADAI, A., "On the Creep of Solids at Elevated Temperature," *Jour. App. Phys.*, Vol. 8, No. 6, 418-432, 10 fig., bib., Lancaster, June, 1937.

3630. NAGATA, Takesi, "A Comparison of the Results of Magnetic Surveys Before and After the Earthquake in Niisima, December 27, 1936," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 497-505, 13 fig., 4 tab., bib., Tokyo, June, 1937.

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

3631. NATURE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 139 of the above periodical (London 1937):

- (1) "Distribution of Destructive Earthquakes," No. 3526, p. 933, May 29.
- (2) "Subsidence of East Tokyo," No. 3528, p. 1024, June 12.
- (3) "Distribution of Deep-focus Earthquakes," No. 3529, p. 1074, June 19.
- (4) "Earthquakes Registered at Kew Observatory, on June 21," No. 3530, p. 1103, June 26.
- (5) "Earthquakes in India," *Ibid.*, 1118-1119, 2 fig., being an account, signed C.D., of the presidential address delivered by W. D. West to the Section of Geology and Geography at a recent meeting of the Indian Science Congress.

3632. NATURE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 140 of the above periodical (London, 1937):

- (1) "Geological Aspects of Deep Drilling Problems," No. 3532, p. 73, July 10.
- (2) "A New Harmonic Analyser," *Ibid.*, p. 74.
- (3) "Formation of Submarine Canyons," No. 3533, p. 117, July 17.
- (4) "Standardization of Physical Units," *Ibid.*, p. 122.

— NEUFELD, J., and SCHERBATSKOY, S. A., "Fundamental Relations in Seismometry" (Abstract only of paper presented before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.

3633. NISHIMURA, Genrokuro, and TAKAYAMA, Takeo, "The Vibration due to Obliquely Incident Waves of a Surface Stratum Adhering Closely to the Subjacent Medium and the Properties of its Resonance Condition," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 394-440, 139 fig., 7 tab., bib., Tokyo, June, 1937.

3634. OBSERVATORY, "Geophysical Meeting on 1936 November 27," *The Observatory*, No. 753, Vol. 60, 42-45, London, Feb., 1937.

3635. OIL WEEKLY, "New Portability in Seismic Instruments," *Oil Weekly*, Vol. 83, Nos. 13, 30 and 34, Houston, Dec. 7, 1936.

— OMOTE, Syun'itiro, and HAGIWARA, Takahiro, "The Niisima Earthquake of December 27, 1936." See No. 3602 of this list.

3636. OXFORD, UNIVERSITY OBSERVATORY, "The International Seismological Summary, 1932, January, February, March," 1-104, Oxford, 1937.

3637. RAMSPECK, A., "Die Verwendung sinusförmiger elastischer Wellen bei der Untersuchung des Baugrundes," *Zeit. Geoph.*, Jahr. 12, Heft 7-8, 354-355, 1 tab., Braunschweig, 1936.

— RANSONE, K., and ROSAIRE, E. E., "The Amount and Distribution of Seismic and Gravity Exploration in the Gulf Coast through 1936." See No. 3645 of this list.

3638. REED, R. D., and HOLLISTER, J. S., "Structural Evolution of Southern California," *Bul. Amer. Ass. Pet. Geol.*, Vol. 20, No. 12, 1529-1704, 57 fig., 1 map, Tulsa, Dec., 1936.

The above valuable paper is sold in bound form as a book by the American Association of Petroleum Geologists, Box 1852, Tulsa, Okla. Price, postpaid, \$2.

3639. RIEBER, Frank, "Complex Reflection Patterns and Their Geologic Sources," *Geophysics*, Vol. 2, No. 2, 132-160, 35 fig., Houston, March, 1937.

A technic is shown for producing synthetic records corresponding to assumed ideal structural conditions, the resulting records being reproduced in the usual visual form, and also in the form of directionally analyzed records. Examples of folding, faulting, and irregular sedimentation are treated—*Author's abstract*.

3640. RIETZ, H. L., "Handbook of Mathematical Statistics." Houghton Mifflin Co. 221 pp., Cambridge, Mass., 1924.

A good reference book on statistics, intermediate between the elementary and the advanced, which should be of use to seismologists wishing to study current statistical treatments of phases of seismology. A.B.

3641. ROBBINS, Frank, "The Royal Astronomical Society's Gold Medallist," *Jour. Brit. Ast. Ass.*, Vol. 47, No. 4, 158-160, London, Feb., 1937.

The above note deals with the presentation of the medal of the Royal Astronomical Society to Dr. Harold Jeffreys. A portrait of Jeffreys appears as the frontispiece of the Journal.

3642. RODGERS, John, "Tilting of Proglacial Lakes," *Amer. Jour. Sc.*, No. 199, Vol. 34, 1-8, 8 fig., New Haven, July, 1937.

3643. ROLLAND, G. F., and WHITE, H. H., "Developments of Essential Characteristics in Electric Blasting Caps for Seismograph Prospecting," *Geophysics*, Vol. 2, No. 2, 119-126, 2 fig., Houston, March, 1937.

3644. ROSAIRE, E. E., "Geophysical Prospecting for Petroleum," *The Military Engineer*, Vol. 28, No. 161, 351-354, Washington, Sept.-Oct., 1936.

3645. ROSAIRE, E. E., and RANSONE, K., "The Amount and Distribution of Seismic and Gravity Exploration in the Gulf Coast through 1936," *Geophysics*, Vol. 2, No. 1, 1-16, 10 fig., Houston, Jan., 1937.

3646. RUGE, Arthur C., "Earthquake Resistance of Elevated Water Tanks," *Proc. Amer. Soc. Civil Eng.*, 801-850, 25 fig., New York, May, 1937. A.C.R.

— RUTHERFORD, H. M., "Geologic Interpretations of Seismic Reflection Data on the Gulf Coast" (Abstract only of paper delivered before the forty-ninth annual meeting of the Geological Society of America, Dec. 29-31, 1936). See No. 3593 of this list.

— RUTHERFORD, H. M., EWING, Maurice, and CRARY, A. P., "Geophysical Investigations in the Emerged and Submerged Atlantic Coastal Plain." See No. 3586 of this list.

3647. SAKURAI, Tokio, "On the Propagation of Waves," *Proc. Phys. Math. Soc. Japan*, Third Ser., Vol. 19, No. 4, 297-328, Tokyo, April, 1937.



- SALVATORI, Henry, "The Mapping of Faults by the Reflection Method" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.
- SCHERBATSKOY, S. A., and NEUFELD, J., "Fundamental Relations in Seismometry" (Abstract only of paper presented before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.
3648. SCHULZE, G. A., "Das elastische Verhalten des Bodens bei sinusförmiger Anregung," *Zeit. Geoph.*, Jahr. 12, Heft 7-8, 350-353, 2 fig., bib., Braunschweig, 1936.
3649. SCIENCE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 85 of the above periodical (New York, 1937):
- (1) "The 'Lost' Asiatic Earthquake of Thursday, January 7," No. 2195, p. 11 (Supp.), Jan. 22.
  - (2) "Benioff Seismograph Given to Williams College," No. 2199, p. 196, Feb. 19.
  - (3) "Structure of the Earth's Core," and "Geophysical Prospecting in Canada," No. 2201, p. 14 (Supp.), March 5.
  - (4) "Japanese Earthquake, Feb. 20," *Ibid.*, p. 18 (Supp.).
  - (5) "A Theory of Mountain Formation," No. 2210, p. 12 (Supp.), May 7.
  - (6) "How Loud is an Earthquake?" and "The Action and Causes of Deep-focus Earthquakes," *Ibid.*, p. 14 (Supp.).
  - (7) "Distribution of Gravity Anomalies," No. 2211, p. 13 (Supp.), May 14.
  - (8) "An Effort to Approach the Tremendous Pressures that Obtain in the Deeper Levels of the Earth's Crust," No. 2213, p. 13 (Supp.), May 28.
  - (9) "The Saint Louis Meeting of the (Eastern Section of the) Seismological Society of America," No. 2216, 8-9 (Supp.), June 18.
  - (10) "Cause of Asiatic Earthquakes," *Ibid.*, p. 10 (Supp.).
3650. SCIENCE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 86 of the above periodical (New York, 1937):
- (1) "Gift to Saint Louis University for the Promotion of Research in Seismology and Geophysics," No. 2218, p. 11, July 2.
3651. SCIENCE NEWS-LETTER. The following short notes of interest to seismologists have appeared in recent issues of Vol. 31 of the above periodical (Washington, 1937):
- (1) "Watch Great Dam for Quakes; Lake's Weight May Bend Rock," No. 845, 396-397, June 19.
  - (2) "Earthquake Shook Mexico During Recent Eclipse," No. 846, p. 406, June 26.
3652. SCIENCE NEWS-LETTER. The following short notes of interest to seismologists have appeared in recent issues of Vol. 32 of the above periodical (Washington, 1937):
- (1) "Strong Earthquake Shock near Peruvian Coast," No. 847, p. 8, July 3.
  - (2) "Atlantic and Pacific Have Quakes on Same Day," No. 848, p. 24, July 10.
  - (3) "July Starts off with two Oceanic Earthquakes," No. 849, p. 36, July 17.
  - (4) "Earthquake Center Found off Mexican Coast," No. 850, p. 57, July 24.

## 3653. SEZAWA, Katsutada, and KANAI, Kiyoshi,

- (1) "On the Elastic Deformation of a Stratified Body Subjected to Vertical Surface Loads," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 359-369, 5 fig., bib., Tokyo, June, 1937.
- (2) "The Same Stationary Vibration of an Origin Accompanying Different Types of Disturbance Therefrom," *Ibid.*, 370-376, 6 fig., 1 tab.
- (3) "On the Free Vibrations of a Surface Layer Due to an Obliquely Incident Disturbance," *Ibid.*, 377-384, bib.
- (4) "Energy Dissipation in the Vibrations of a Bridge. I," *Ibid.*, 385-393, 3 fig., bib.

— SHARPE, J. A., "Magnitude and Character of the Elastic Waves Produced by Explosion Pressures" (Abstract only of paper delivered before the seventh annual meeting of the Society of Exploration Geophysicists, March 15-19, 1937). See No. 3593 of this list.

— SHARPE, J. A., and LEITH, Andrew, "Deep-focus Earthquakes and Their Geological Significance." See No. 3621 of this list.

## 3654. SHAW, H., "Applied Geophysics," Paper covers, octavo, 100 pp., illus. Price 2s. H.M. Stationery Office, London.

— SHEPARD, Francis P., "Salt Domes Related to the Mississippi Submarine Trough" (Abstract only of paper delivered before the forty-ninth annual meeting of the Geological Society of America, Dec. 29-31, 1936). See No. 3593 of this list.

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3655. SMITH, A. L., and WILSON, John H., "Abnormal Velocities in Sedimentary Beds in Eastern Utah," *Geophysics*, Vol. 2, No. 1, 56-62, 3 fig., Houston, Jan., 1937.3656. SPITALER, R., "Beziehungen der Stellungen und Phasen des Mondes zu den Erdbeben," *Ger. Bei.*, Bd. 49, Heft 3, 296-297, bib., Leipzig, 1937.3657. STEGNER, Wallace E., "C. E. Dutton—Explorer, Geologist, Nature Writer," *Scien. Month.*, No. 262, Vol. 45, No. 1, 83-85, portrait, New York, July, 1937.3658. STEHN, C. E., and BERLAGE, H. P., Jr., "Vulkanische verschijnselen en aardbevingen in den Oost-Indischen Archipel waargenomen je dirende het jaar 1935," *Natuurkundig Tijdschrift voor Nederlandsch-Indië*, Vol. 96, No. 3, 179-216, Batavia, 1936.

On page 219 of the same issue of the above journal appears a short note by the second of the above authors on an earthquake in the Java sea with a focal depth of about 600 km. R.Z.

3659. STRELE, Georg, "Chronologie des grands éboulements Alpains," *Mat. E. Cal.*, No. 38, 121-137, Geneva, 1936.3660. TAKAHASI, Ryutaro, and MINAKAMI, Takeshi, "Tilt Observations during the Recent Activities of Volcano Asama," *Bul. Eq. Res. Inst.*, Vol. 15, Part 2, 463-491, 3 fig., 3 tab., bib., Tokyo, June, 1937.

- TAKAYAMA, Takeo, and NISHIMURA, Genrokuro, "The Vibration due to Obliquely Incident Waves of a Surface Stratum Adhering Closely to the Subjacent Medium and the Properties of its Resonance Condition." See No. 3633 of this list.
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## APPENDIX

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Section 10 (79-84) is devoted to listing patents of interest in geophysics. The titles and numbers of these are listed in this bibliography under the names of: Blau, Statham, Karcher, Merrill, Young, North, Prescott, Searcy, Rieber, Turner, and Weatherby. Descriptions of the patents will be found in the issue of *Geoph. Abs.* listed above.

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3720. GEOLOGICAL SOCIETY OF AMERICA. The Geological Society of America has given grants to the following persons for carrying out the researches indicated:

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## SUBJECT INDEX FOR THE YEAR 1937

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Many of the notes refer to earthquakes and earthquake sounds.

As indicated by the reference, *The Fortean*, the organ of a society by the same name, has only begun publication recently. It is a curious combination of bits of news of the type: "Mr. and Mrs. . . . report that what was a pear tree last year is bearing cherries this year;" and tirades against science of the nature of the introduction to the first article in the first issue, written by the secretary of the society, who is also the editor of the magazine: "Who Killed Earhart and Noonan?" by Tiffany Thayer. "I won't be quiet—if this is the last collection of words I set down on paper—not if this is the last breath I draw. Amelia Earhart and Fred Noonan were murdered by Dogmatic Science . . . sent to their death by the smug complacency of Authority, of the schoolmen and the physicists and the astronomers who strut before us in the sacred vestments of a priesthood more obnoxious than any other history records."

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The author writes out of the fullness of his long experience as an investigator and teacher engaged in the study of seismology. The text is a condensed collection of practical details, particularly of value to those working in seismology in countries where they have less opportunity for practical field work. It is an excellent text for students also. While some mathematical formulae are given and a few developed, it is, in general, a non-mathematical book.

The book may be ordered directly from the publishers, Maruzen Co., Ltd., P.O. Box 605, Tokyo Central, at \$3.50 or 15s., postpaid. It may also be obtained from any of the following: Charles Scribner's Sons, New York; G. E. Stechert and Co., New York; Nystrom Co., Chicago; Arthur B. Clark Co., Glendale, Cal.; Puget Sound News Co., Seattle; Dawson's Bookshop, Los Angeles. A.I. + N.H.H. + R.R.B.

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## PUBLICATIONS

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R. MELDRUM STEWART, *Dominion Astronomer*

Vol. XII

## Bibliography of Seismology

No. 19

Items 4021 - 4138

JULY, AUGUST, SEPTEMBER, 1938

BY

ERNEST A. HODGSON

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# Bibliography of Seismology

July, August, September, 1938

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Mr. Bodle, the editor of *Earthquake Notes*, would be glad to receive communications of interest to seismologists and suitable for publication in future issues of this periodical, which is the official organ of the Eastern Section of the Seismological Society of America. He may be addressed at the U.S. Coast and Geodetic Survey, Washington, D.C.
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After completing a stereographic location for an earthquake epicentre it is necessary to convert the distance of the located point from the centre of projection into degrees of latitude. This scale is graduated to permit of the latitude being read off directly. Two scales are provided: 5 cm. to 90°, and 5 in. to 90°. This device is very useful where the stereographic method is being used for locating earthquake epicentres.

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In this book the author has condensed the results of more than forty years of work upon the periodicity of earthquakes. It contains a summary and—with the aid of many new catalogues of earthquakes—an extensive revision of various articles published by the author. The bearing of these studies on the movements of the earth's crust is brought out in the last chapter of the book. The first chapter deals with the method of investigations, and chapters II to VII deal respectively with the annual, diurnal, eleven-year, lunar, nineteen-year, and forty-two minute periods. R.R.B.+T.M. Co.

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4054. GABRIEL, V. G., and WILSON, R. M., "Shot Point and Short Distance Geophones in Seismic Prospecting," *Oil Weekly*, Vol. 88, No. 9, 14-16, 2 fig., 2 tab., bib., Houston, Feb. 7, 1938. J.H.H.
- GARDESCU, I. I., "Shallow Stratigraphic Variations over Gulf Coast Structures" (discussion). See No. 4108 of this list.
- GÉNAUX, Léonide, and BRAZIER, Charles Émile, "Sur le séisme du 11 juin 1938." See No. 4032 of this list.
4055. GEOLOGICAL SOCIETY OF AMERICA. The following grants by the Geological Society of America for research in seismology and allied subjects are included in a list published on page 8 of *Science*, No. 2270, Vol. 88, New York, July 1, 1938:  
 (1) Dr. Louis B. Slichter, professor of geophysics, Massachusetts Institute of Technology, \$5,350 for a large-scale seismic investigation of the earth's crust in New England.



- (2) Dr. Perry Byerly, professor of seismology, the University of California, \$900 for an investigation to determine whether various portions of the earth's crust have free vibration periods during earthquakes.
- (3) Dr. David Griggs, research physicist, Harvard University, \$675 for constructing instruments to test the deformation of rocks under high confining pressures in the laboratory.
- (4) Arthur Keith, U.S. Geological Survey, Washington, D.C., \$665 to continue and complete the studies of Appalachian structure and stratigraphy in the Province of Quebec and adjacent areas.

4056. GEOLOGICAL SOCIETY OF AMERICA. Abstracts of papers presented at various meetings of the above organization are published in the *Proceedings of the Geological Society of America for 1937* (New York, June, 1938). The papers of particular interest to seismologists are listed in this issue of the *Bibliography* under the names of the authors. The authors so listed are: Ewing, Woollard, Vine, Grant, Shepard, Griggs, Reid, Willis, Hubbert, Gutenberg, Buwalda, Taliaferro, Rich, and Chamberlin.

— GERSHÁNIK, Simón, "Resultados sismométricos del Año 1934 (La Plata)." See No. 4084 of this list.

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- (2) "Régions séismiques donnant à Zi-ka-wei des *iP* initiaux de dilatation ou de compression," *U.G.G.I., Ass. Séis., Trav. Sc.*, Ser. A, Fasc. 15, Part 2, 133-136, Strasbourg, 1937.

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— GRANT, U. S., and SHEPARD, F. P., "Short-period Oscillations of Southern California Beaches and Adjacent Sea Floor." See p. 84, *Proc. 1937, G.S.A.*, reported as No. 4056 of this list.

— GREEN, William G., "Seismograph" (Patent). See No. 4103 of this list.

— GRENET, G., and COULOMB, J., "Sur les séismographes électromagnétiques." See No. 4045 of this list.

— GRIGGS, David, "Experimental Deformation of Rocks." See p. 85, *Proc. 1937, G.S.A.*, reported as No. 4056 of this list.

4059. GUTENBERG, B., and RICHTER, C. F., "P' and the Earth's Core," *M.N., Geoph. Sup.*, Vol. 4, No. 5, 363-372, 2 fig., 4 tab., bib., London, May, 1938.

The first paragraph of their summary reads: "Waves formerly identified as diffracted P' can be accounted for more satisfactorily as ordinary refracted waves, provided that the velocity distribution within the core is assumed to be as follows: velocity increasing from about 8 km/sec. at the inside surface of the core to about 10.2 km/sec. about 1950 km. deeper, where there is a rapid but probably continuous increase with depth, the velocity reaching 11.4 km/sec. within 300 km., then decreasing slowly to 11.3 km/sec. at the centre."

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A popular article describing reflection shooting method of seismic prospecting.

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The above historical paper is most valuable. It might well be published as a book. Part I deals with the development of our knowledge respecting the nature of seismic waves. Part II discusses the mechanism of earthquake occurrence as revealed through studies of the initial motions of earthquakes. The bibliography given is very extensive.

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- (2) "The Pahiatua Earthquake of 1934, March 5," *N.Z. Jour. Sc. Tech.*, Vol. 19, No. 6, 382-388, 3 fig., tab., bib., Wellington, 1937.
- (3) "Dominion Observatory: Report on the Activities of the Observatory during the Year Ended 31st December, 1936," *Annual Report of the Department of Scientific and Industrial Research*, 6 pp., 1 fig., tab., Wellington, 1937.
- (4) "Earthquakes in New Zealand, including Earthquake Summaries for the Year 1936," *N.Z. Official Year Book, 1938*, 5 pp. in reprint.
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— HEILAND, Carl A., "Vibration Detector" (Patent). See No. 4103 of this list.

4065. HEINRICH, "Bestimmung der Fortpflanzungsgeschwindigkeiten elastischer Wellen im oberschlesischen Karbon," *Zeit. Berg-, Hütten-, und Salinenwesen im Deutschen Reich*, Vol. 84, No. 10, 436-439, Berlin, 1937.

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The above paper is issued also as No. 55 of the *Bulletins of the Department of Scientific and Industrial Research, New Zealand*. A lengthy review, signed G.D.L., appears on pp. 61-62 of *Bul. S.S.A.*, Vol. 28, No. 1, Jan., 1938.

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— HORNIBROOK, Floyd B., ROGERS, Jesse S., and PIGMAN, George L., "A Portable Apparatus for Measuring Vibration in Fresh Concrete." See No. 4105 of this list.

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4071. JAGGAR, T. A.,

(1) "Earthquake Tidal Wave, March 2, 1933," *Volcano Letter*, No. 397, Honolulu, March, 1933.

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4072. JEFFREYS, Harold, "The Law of Error and the Combination of Observations," *Phil. Trans. Roy. Soc. London*, Ser. A, No. 777, Vol. 237, 231-271. Price 5s. London, April 14, 1938.



— JUDSON, S. A., "Shallow Stratigraphic Variations over Gulf Coast Structures" (discussion). See No. 4108 of this list.

4073. KAMEL, M., and FALTAS, F., "Seismische Bestimmung der Lage einer geneigten ebenen Grenzschrift aus Laufzeiten und Amplituden," *Zeit. Geoph.*, Jahr. 12, Heft 7-8, 383-395, 8 fig., bib., Braunschweig, 1936.

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4074. KARCHER, J. C., "A Review of the Relation between Physics and Geology in Petroleum Exploration," *Geophysics*, Vol. 3, No. 2, 69-77, Houston, March, 1938.

4075. KIRKPATRICK, R. Z., "Trigger Forces—Canal Zone Earthquakes," *Bul. S.S.A.*, Vol. 28, No. 1, 15-22, 1 fig., 2 tab., bib., Berkeley, Jan., 1938.

4076. KIRNOS, D. P., "Grundzüge der Theorie und der Berechnung der Vibrographen," *Acad. Sc. URSS., Pub. Inst. Séis.*, No. 81, 91 pp., 50 fig., 10 tab., Moscow-Leningrad, 1938.

The paper is in the Russian language throughout.

N.V.R.

4077. KÖHLER, R., "Messung der Schwingungskennziffern und Herabminderung der Erschütterungen in einer Kohlenwäsche," *Zeit. Geoph.*, Jahr. 12, Heft 4, 148-166, 14 fig., bib., Braunschweig, 1936.

The above paper is No. 23 of the series: *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

4078. KOPERBERG, M., "Aanteekeningen over het Sopoetan-gebergte in de Minahassa (Notes on the Sopoetan mountain ridge in the Minahassa, Isle of Celebes)," *Verlag van de geware vergadering der wis- en natuur-kundige afdeeling van de koninklijke Akademie van Wetenschappen*, Vol. 18, 110-126, 273-294, Amsterdam, June, September, 1911.

The author found a recognizable relation between the seismic perturbations and the Pentoe-solfatara of 1901. The combination of the beginning and the greatest violence of the seismic disturbance in the origin of the Pentoe-solfatara appeared to be of significance. The pleistoseismic region appeared to coincide with the next environs of that solfatara. The fissures south of the Sempoe had a direction of about N 40° E and are, according to the author, of seismic origin. In the second article the author compiled a table of the earthquakes of the Minahassa during the first six months of 1901, 1906, and 1907; and a table of the frequency of the earthquakes in the Minahassa, and the volcanic phenomena there and in the neighbourhood during the period 1887-1908.

J.F.S.

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- (3) McHENRY, Karmon Lorane, "Method of Recording Seismic Waves," U.S., 2,063,820, Dec. 8, 1936. (3646)
- (4) SALVATORI, Henri, "Apparatus for Determining Subsurface Geologic Formations," U.S., 2,064,385, Dec. 15, 1936. (3647)
- (5) VOORHEES, Vanderveer, "Seismic Surveying," U.S., 2,064,451, Dec. 15, 1936. (3648)
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— SEAGER, A. A., "Shallow Stratigraphic Variations over Gulf Coast Structures" (discussion). See No. 4108 of this list.

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4126. TRAPPE, Fr., "Die Anwendung der seismischen Reflexionsmethode in Deutschland," *Oel und Kohle*, Vol. 12, No. 42, 901-904, Berlin, 1936.

An abstract by W. Ayvazoglou appears as No. 3602, pp. 22-23, of *Geoph. Abst.* 88, reported as No. 4024 (1) of this list.

4127. TYDEMAN, G. F., "Vier Opstellen," G. Naef, 126 pp., 5 fig., bib., Gravenhage, 1938.

The sub-titles of the four sections are as follows:

- (1) De orde in het Zonnestelsel.
- (2) De Zon en de Zonnevlekken.
- (3) De poolvlucht en de Sima-Sial-Drift-Theorie.
- (4) De aard-rotatie en de seculaire variatie van het Oceaan-niveau. G.F.T.

4128. UCHIDA, K., *et al.*, "The Sakurajima's Memorial: The Eruption of January 12, 1914," 42 pp., 28 illus., Tokyo, 1938.

The above is a deluxe publication 10" x 12" on excellent paper. It is dedicated to Prof. F. Omori and to Dr. S. Hase. The illustrations are reproductions of sketches made at the time by the various members of the expedition: K. Uchida, M.D., T. Morowoka, M.D., Y. Ootawa, M.D., and H. Iijima, M.D. The entire paper is in Japanese except for the explanations of the illustrations which are in both Japanese and English, and a four-page article in English at the end of the booklet by Dr. Iijima, entitled "On the Bacteriological Examination of Volcanic Ashes and the Various Injuries Caused by the Eruption." The paper is listed in this bibliography largely because of the excellent illustrations which are of interest to seismologists.

4129. URREN, L. C., "New Method of Seismic Survey Affords More Information," *Oil and Gas Jour.*, Vol. 35, No. 43, 52-55, Tulsa, 1937.

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4130. VAN DIJK, G., "Seismische Registreringen in DeBilt, 1935," *Koninklijk Nederlandsch Meteorologisch Instituut Pub.*, No. 108, 49 pp., Gravenhage, 1937.

The above is No. 23 of the series on seismological registration.

4131. VAN DUERSEN, A., "Uz, het land van Job" (Uz, the country of Job), *Comptes Rendus du 15<sup>e</sup> Congrès International de Géographie, Amsterdam, 1938*, Tome 2, Section 4, 203-205, Leiden, 1938.

According to the author, who describes Uz geographically, the scene of the history of Job is imagined in a territory which is characterised by earthquakes and post-volcanic phenomena. The group of faults of El Ophor would be one of the regions with the greatest seismic frequency. This group belongs to the Araba and the territories on either side of it. J.F.S.

- VAUGHAN, T. Wayland, "A Bathymetric Map of the Atlantic Ocean, 1:5,000,000, Sheet SII<sub>2</sub>." See No. 4123 of this list.

- VINE, A. C., EWING, Maurice, and WOOLLARD, G. P., "Geophysical Investigations in the Submerged and Emerged Atlantic Coastal Plain (Part III)." See p. 80, *Proc. 1937, G.S.A.*, reported as No. 4056 of this list.

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- (1) "Macroseismographical Observations in the Region of Kliuchevskoi Volcano, from September 1 to December 31, 1935," *Acad. Sc. USSR., Bul. Kamchatka Volcan. Station*, No. 1, p. 17, Moscow-Leningrad, 1937.
- (2) "Macroseismographical Observations in the Region of Kliuchevskoi Volcano, from January 1 to October 1, 1936," *Ibid.*, No. 2, 25-26, 1938. V.I.V.

4133. VOLCANO LETTER, "The Maui Earthquake of January 22, 1938," *The Volcano Letter*, No. 457, 1-5, 4 fig., Honolulu, March, 1938.

The description of an earthquake which occurred in the Hawaiian islands but was registered on distant seismographs.

— VORHEES, Vanderveer, "Seismic Surveying" (Patent). See No. 4103 of this list.

## 4134. VOSS, Karl Heinz, "Vergleich der Bodenbewegungen bei Sprengungen und Maschinenschwingungen," Dissertation, 24 pp., 2 fig., 3 pl., bib., printed by W. Fr. Kaestner, Göttingen, 1937.

The above is listed as No. 31 of the series: *Seismische Untersuchungen des Geophysikalischen Instituts in Göttingen*.

— WEATHERBY, B. B., "Method of Making Subsurface Determinations" (Patent). See No. 4103 of this list.

— WEATHERBY, B. B., "Shallow Stratigraphic Variations over Gulf Coast Structures" (discussion). See No. 4108 of this list.

— WENNER, Frank, and McCOMB, H. E., "Recherches à la plate-forme d'essai sur les séismomètres téléseismiques," and "Le séismomètre Galitzine; sur les divergences entre la théorie de Galitzine et les résultats expérimentaux d'un séismomètre Wilip-Galitzine." See No. 4087 of this list.

4135. WESTLAND, A. J., S.J., "Eastern Section of the Seismological Society of America," *Science*, No. 2267, Vol. 87, p. 534, New York, June 10, 1938.

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— WILLIS, Bailey, "Asthenolith (Melting Spot) Theory." See p. 120, *Proc. 1937, G.S.A.*, reported as No. 4056 of this list.

— WILSON, R. M., and GABRIEL, V. G., "Shot Point and Short Distance Geophones in Seismic Prospecting." See No. 4054 of this list.

— WOOLLARD, G. P., VINE, A. C., and EWING, Maurice, "Geophysical Investigations in the Submerged and Emerged Atlantic Coastal Plain (Part III)." See p. 80, *Proc. 1937, G.S.A.*, reported as No. 4056 of this list.



4136. WOOLLCOTT, Alexander, "The Prodigal Father," from the book, *While Rome Burns* (Penguin Edition), 143-151, Penguin Books, Ltd., Harmondsworth, Middlesex, England, 1937.

An intimate pen picture of Frank Lloyd Wright, the "Father of Modern Architecture," who achieved such an outstanding success in designing the Imperial Hotel, Tokyo, to withstand earthquakes.

Another article about Wright appears in the *Readers Digest* for September, 1937. See No. 4137 of this list.

4137. WRIGHT, Frank Lloyd, "Building against Doomsday," *Readers Digest*, No. 185, Vol. 31, 70-74, Pleasantville, N.Y., Sept., 1937.

The above is a short review of a section of the autobiography of Frank Lloyd Wright (Longmans, Green and Co., 1932. Price \$3.50) dealing with the building of the great Imperial Hotel in Tokyo, which was designed to withstand earthquakes and has triumphantly done so. See also No. 4136 of this list.

4138. ZSCHOCHER, W., "Le rayonnement séismique des villes et les normes de la construction antiséismique," *Acad. Sc. URSS., Pub. Inst. Séis.*, No. 85, 19 pp., 7 fig., Moscow-Leningrad, 1938. N.V.R.

The paper is in the Russian language throughout.

## LIST OF COLLABORATORS

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

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The section headings of the issue here listed are as follows: Special meeting of Eastern Section with Geological Society of America; North Eastern Seismological Association formed; Maine shock of August 22, 1938; New Jersey shocks of August 22, 23, and 27, 1938. Professor Cairns to speak on seismology at Richmond meeting of American Association; Pasadena—new preliminary instrument report, etc.; New director for Buffalo seismograph station; Vibration tests at Morris dam; Toronto and Victoria seismograph stations discontinued (error in text of this section writing *Ottawa* for *Toronto*); New book on seismology (Leet); Committee on engineering seismology; Earthquake distribution in the United States; Des Moines station to resume operation; Transfers at Coast and Geodetic Survey; Ground and building vibration work on west coast; Earthquake correspondence for *Nature*; Popular article on seismology; Vibration experiments in Japan; Velocity of elastic waves in sand; Theory of Rocky Mountain formation; Belgian earthquake of June 11, 1938; PWA appropriation for seismology; Interpretation of strong-motion records; Epicentres; Proceedings of the Massachusetts Meeting of the Eastern Section, with abstracts of papers by: Heck, Gibbs, Birch and Bancroft; Ramirez, Robertson, Blake, J. Lynch, Schmitt, Langguth, Devlin, and W. Lynch. Titles of these will be found listed in this issue of the *Bibliography* under the names of the respective authors. See also No. 4254 of this list.

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In 1908, Karl Sapper advised the Governor of Rabaul to provide that town with wooden houses having steep roofs, lest earthquakes and rains of volcanic ash should tumble them down. On May 25, 1937, violent earthquakes preceded the eruptions of the following day. J.F.S.

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 (1) "Longitudinal Velocities in Some Weathered and Unweathered Carboniferous Rocks," *Bul. S.S.A.*, Vol. 28, No. 3, 163-168, 2 fig., bib., Berkeley, July, 1938.  
 (2) "Earthquakes in Northeastern America, July-December, 1937," *Ibid.*, 169-176, 3 fig.
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- LIFSHITZ, E., and LANDAU, L., "Statistical Physics." See No. 4189 of this list.
4194. LORENZ, H., "Beiträge zur Theorie des Erdaufbaus," *Zeit. Geoph.*, Jahr. 14, Heft 5-6, 142-152, 3 fig., bib., Braunschweig, 1938.
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 The above is marked *Preliminary Mimeographed Edition*. It is published by the Division of Geology and Geography, National Research Council, Washington. It presents a review of the problems awaiting research in the fields indicated—problems which require the co-operation of workers in the related sciences. The section on "Elasticity, Gravity, Electricity, and Magnetism," appears on pp. 21-33. It is most suggestive and stimulating and should be read by all working seismologists on this continent. E.A.H.
4196. LUNDBERG, H., "Recent Advances in Geophysical Prospecting," *Can. Min. Metal. Bull.*, No. 308, 758-788, Montreal, Dec., 1937.  
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4197. LYNCH, Joseph, S.J., "The Earthquake of November 14, 1937," *Bul. S.S.A.*, Vol. 28, No. 3, 177-189, 6 tab., 22 fig., Berkeley, July, 1938.
- LYNCH, Joseph, S.J., "The *S* and *SKS* Curves for 250-km. Depth for the Earthquake of November 14, 1937" (abstract). See No. 4148 of this list.
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  - (2) "Die instrumentelle Ausrüstung des Observatoriums," *Ibid.*, 45-59, 4 fig., bib.
  - (3) "Über einige durch künstliche Einflüsse entstehenden Störungen in den Erdbebenregistrierungen," *Ibid.*, 60-65, 3 fig.
  - (4) "Bemerkungen zur Arbeit G. Fritzsche: 'Untersuchungen über die von Maschinen, Fahrzeugen und Wind hervorgerufenen Boden- und Gebäudeerschütterungen nach Registrierungen eines Benioff-Vertikal-Seismographen (Diese Veröffentlichung, Bd. X, Anhang 1),' " *Ibid.*, 66-70, 1 fig.
  - (5) "Zur Bestimmung der Konstanten der Benioff-Seismographen," *Ibid.*, 71-73, bib.
- MILDNER, P., and WEICKMANN, L., "Die in den Jahren 1931 bis 1935 in Leipzig und im Observatorium am Collberg aufgezeichneten Erdbeben." See No. 4252 of this list.
4202. MINAKAMI, Takeshi,
- (1) "Explosive Activities of Volcano Asama and Tiltings of the Earth's Surface," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 372-390, 21 fig., bib., Tokyo, June, 1938.
  - (2) "The Hinomisaki-Oki Earthquake of January 12, 1938," *Ibid.*, 470-483, 10 pl. The second of these papers is in Japanese with a short *résumé* in English.
4203. MITERA, Z. A.,
- (1) "Problems of Application of Seismic Reflection Methods in the Polish Eastern Carpathian Mountains in the Light of Present Investigations" (in Polish), *Polskiego Towarzystwa Geologicznego Rocznik*, Vol. 12, 1-21, Krakow, 1936.
  - (2) "Studies on Seismic Methods of Prospecting and Their Application in Exploration for Oil in Poland" (abstract of paper presented at 2d Petroleum Congress, Paris, June 14-19, 1937), *Pet. World*, Vol. 34, No. 442, p. 165, London, 1937.
- Abstracts of the above papers prepared by W. Ayvazoglou appear as Nos. 4013 and 4014, respectively, p. 157, of *Geoph. Abst. 91*, reported as No. 4141 of this list.
4204. MITERA, Z. A., "Present Status and Future Aspects of Geophysical Exploration in Poland," *Geophysics*, Vol. 3, No. 3, 225-233, 6 fig., Houston, July, 1938.
4205. MUSKAT, MORRIS, "The Reflection of Longitudinal Wave Pulses from Plane Parallel Plates," *Geophysics*, Vol. 3, No. 3, 198-218, 9 fig., 3 tab., bib., Houston, July, 1938.
4206. NATIONAL RESEARCH COUNCIL, U.S.A., "Research in the Fields of Geology, Chemistry, and Physics," *Science*, No. 2206, Vol. 85, 361-362, New York, April 9, 1937.

4207. NATURE. The following items of interest to seismologists have appeared in recent issues of Vol. 142 of the above publication (London, 1938):

- (1) "Lunar Periodicity of Earthquakes," No. 3584, p. 81, July 9.
- (2) "Tilting of the Ground at Wellington," No. 3585, p. 121, July 16.
- (3) "Alaska Earthquake of July 22, 1937," No. 3586, p. 172, July 23.
- (4) "Destructive Earthquake in Greece," No. 3587, p. 202, July 30.
- (5) "Earthquakes in India," *Ibid.*, p. 303.
- (6) "Earthquakes and Surface Structure of the Earth," No. 3589, p. 299, Aug. 13.
- (7) "Recent Minor Earthquakes," No. 3590, pp. 326 and 351, Aug. 20.
- (8) "Seismological Research in Japan," *Ibid.*, p. 362.
- (9) "Earthquake of August 16," No. 3591, p. 390, Aug. 27.
- (10) "Geophysical Observatory at Zi-ka-wei," *Ibid.*, p. 391.
- (11) "Earthquake in the Philippines," No. 3593, p. 472, Sept. 11.
- (12) "The Los Angeles Earthquake," *Ibid.*, p. 472.
- (13) "Recent Earthquakes," No. 3594, pp. 508 and 533, Sept. 17.
- (14) "Earthquakes in Italy and New Zealand," and "Renewed Seismic Activity in Greece," No. 3595, p. 567, Sept. 24.
- (15) "Greek Earthquake of July 20, 1938," No. 3596, p. 624, Oct. 1.

4208. NATURE. "Statistical Theory," *Nature*, No. 3601, Vol. 142, p. 814, London, Nov. 5, 1938.

The above is a brief review, signed R.W.G., of a book by Leonard J. Holman, entitled "Simplified Statistics" (Sir Isaac Pitman and Sons, pp. xii+142. Price 3s. 6d. London, 1938).

4209. NAVARRO NEUMANN, E. M. S., S.J., "Sur le tremblement de terre du Dogger Bank (7-VI-1931)," *Bol. Soc. Sis. Ital.*, Vol. 36, No. 1-2, 14-17, bib., Rome, 1938. N.N.

4210. NISHIMURA, Genrokuro, and TAKAYAMA, Takeo, "Seismic Waves due to Traction Applied to the Inner Surface of a Spherical Cavity in an Elastic Earth," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 317-354, 44 fig., bib., Tokyo, June, 1938.

4211. ORDAZ, F. Patino, "Catalogo de los temblores registrados en la red Sismologica Mexicana durante los años de 1931 y 1932," Universidad Nacional de Mexico, Instituto de Geologia, 125 pp., Mexico City, 1937.

The report covers the recording at the stations Tacubaya, Chihuahua, Guadalajara, Manzanillo, Mazatlan, Merida, Oaxaca, Puebla, Veracruz, and Santa Barbara (Mex.), for the years indicated. In addition to the seismological readings the geographical co-ordinates are given for each station, together with the list of instruments.

4212. OTUKA, Yanosuke, "Geologic Structure of the Eastern Ibara District, Sizuoka Prefecture, Japan," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 415-451, num. fig., pl., diag., Tokyo, June, 1938.

The paper is in Japanese but there is a lengthy summary in English, together with tables, diagrams, etc. repeated in English.



4213. PHILOSOPHICAL SOCIETY OF WASHINGTON. Abstract of papers presented before the above Society are given in *Jour. Wash. Acad. Sc.*, Vol. 28, No. 8, Washington, Aug. 15, 1938. Those of particular interest to seismologists are as follows:
- (1) SHEPARD, E. R., "Electrical Resistivity and Seismic Exploration for Road Beds and Other Engineering Structures," p. 374.
  - (2) RAPPLEYE, H. S., "Use of Levelling in Determining Ground Movements," p. 377.
  - (3) HOSKINSON, A. J., "Gravity in the Empire State Building," p. 377.
- PIDDINGTON, Henry, "The Law of Storms." See No. 4223 of this list.
- PIGGOT, C. S., "The Technique of Securing Undisturbed Core-samples of the Ocean Bottom." See No. 4166 of this list.
4214. PIRSON, S. J., "Practical, Graphical, and Approximation Methods for Dip-shooting Calculations," *Oil Weekly*, Vol. 85, No. 7, 22-34, Houston, 1937.
- A lengthy abstract by Ayvazoglou appears as No. 3856, pp. 110-111, of *Geoph. Abst.* 90, reported as No. 4140 of this list.
4215. POPESCU-CERNAUTI, I. G., "Sur le problème de la séismicité en Roumanie," *C.R. Acad. Roum.*, Vol. 2, No. 2, 182-189, 1938.
4216. POSPELOV, P. A., and VASILEV, M. V., "Experimental Seismic Tests of the Reflected Wave Method in the Apsheron-Khodyzhenskoi Region" (in Russian), *Neftyanoe Khozyaistvo* (Petroleum Industry), Vol. 12, 58-63, Moscow, Dec., 1937.
4217. PRESCOTT, Harold R., and WOODYARD, Kenneth C., "Seismophone" (patent). U.S. No. 2,084,561, June 22, 1937. See No. 3929, p. 133, *Geoph. Abst.* 90, reported as No. 4140 of this list.
- RAMIREZ, J. Emilio, S.J., "The Colombian Earthquake of February 5, 1938," and "Air Oscillations and Ground Oscillations" (abstracts). See No. 4148 of this list.
4218. RANSONE, W. R., "Seismic Exploration in Eastern Venezuela," *Geophysics*, Vol. 3, No. 3, 219-224, 6 fig., Houston, July, 1938.
- RAPPLEYE, H. S., "Use of Levelling in Determining Ground Movements" (abstract only). See No. 4213 of this list.
- RICE, Hugh S., "The Free Pendulum—the Most Accurate Clock in the World." See No. 4179 of this list.
- ROBERTSON, Florence, "The Mexican Earthquake of December 23, 1937" (abstract). See No. 4148 of this list.
4219. ROTHÉ, J. P., "Chronique sismologique: les principaux séismes ressentis par l'homme en 1937," *Rev. Étude Cal.*, Tome 1, No. 2, 94-102, Geneva, July-Aug., 1938.
- On page 109 of this issue of the *Revue* appears also an account of the establishment of a student prize in memory of Mario Baratta.
- RUDE, G. T., "New Methods of Marine Surveying." See No. 4166 of this list.

- RÜLKE, O., THYSSEN, St. v., and HUMMEL, J. N., "Über das Wesen des seismischelektrischen Effektes." See No. 4244 of this list.
4220. RUTTEN, L. M. R., "Bibliography of West Indian Geology," *Geographische en Geologische Mededeelingen, Publicaties uit het Geographisch en uit het Mineralogisch-Geologisch Instituut der Rijksuniversiteit te Utrecht, Physiografisch-Geologische Reeks*, No. 16, 103 pp., Utrecht, 1938. L.M.R.R. + J.F.S.
- The above valuable publication is the result of some years of work on the part of its editor. A total of 2,434 publications is listed, with full bibliographical data but without abstracts. The listing is by author but a subject index is appended. Under the subject *Earthquakes*, are 275 references, while 15 are listed under *Geophysics*.
4221. SAITA (SAIDA), Tokitaro, "The Peculiarity of Chinese Earthquake Disasters and the Seismic Intensities as Deduced from Remaining Pagodas," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 407-414, 20 pl., Tokyo, June, 1938.
- The paper is in Japanese with a lengthy *résumé* in English.
- SATO, Mitunosuke, and HUKUNAGA, Mituo, "Crustal Deformations in Central Taiwan (Part 1)." See No. 4180 of this list.
4222. SAWDON, Wallace A., "Geophysics Has Proved Its Importance in California Prospecting," *Petroleum Engineer*, Vol. 9, No. 11, 23-24, Dallas, July, 1938. J.H.H.
4223. SAYLES, Robert W., "The Occurrence of Earthquakes During Storms, as Reported by Henry Piddington in 'The Sailors Horn-book for the Law of Storms' (1876)," *Bul. S.S.A.*, Vol. 28, No. 3, 201-204, 1 fig., Berkeley, July, 1938.
- SCHMITT, A. R., S.J., "The Northern Indiana Earthquake of February 12, 1938" (abstract). See No. 4148 of this list.
4224. SCHOOLEY, Allen H., "An Electro-mechanical Method for Solving Equations," *RCA Review*, Vol. 3, No. 1, 86-96, 5 fig., bib., New York, July, 1938.
4225. SCIENCE. The following short notes of interest to seismologists have appeared in recent issues of Vol. 88 of the above periodical (New York, 1938):
- (1) "Mountain Building," No. 2272, p. 8 (Supp.), July 15.
  - (2) "Earth Rotation Varies," No. 2282, p. 11 (Supp.), Sept. 23.
  - (3) "River in the Submerged Grand Canyon of the Pacific Coast," No. 2285, pp. 8 and 10 (Supp.), Oct. 14.
4226. SCIENCE NEWS-LETTER. The following brief items of interest to seismologists have appeared in recent issues of Vol. 34 of the above periodical (Washington, 1938):
- (1) "Earth Trembles" (July 22 and July 24), No. 6, p. 95, Aug. 6, 1938.
  - (2) "Earth Trembles" (July 29), No. 7, p. 109, Aug. 13.
  - (3) "Earth Trembles" (Aug. 4), No. 8, p. 115, Aug. 20.
  - (4) "Earth Trembles" (Aug. 24), No. 10, p. 155, Sept. 3.
  - (5) "Earth Trembles" (Aug. 29), No. 11, p. 171, Sept. 10.
  - (6) "Earth Trembles" (Sept. 1), No. 12, p. 183, Sept. 17.

4227. SCIENTIFIC AMERICAN. "Scales of the Ten Largest Dams in the United States," *Scien. Amer.*, Vol. 159, No. 3, p. 145, New York, Sept., 1938.

Both plan and elevation drawings to scale indicate the relative sizes of these great dams.

4228. SCIENTIFIC MONTHLY. "Seismic Waves," *Scien. Month.*, Vol. 47, No. 2; pp. 190, 192; 1 fig., New York, Aug., 1938.

A short account of the research on seismic wave propagation from blasts to be carried out under the direction of Dr. L. B. Slichter of the Massachusetts Institute of Technology.

4229. SEWELL, R. B. S., *et al.*, "Geophysical Discussion: The Topography of the Ocean Floor," *Observatory*, No. 772, Vol. 61, 229-240, London, Sept., 1938.

Others contributing to the discussion were: J. D. H. Wiseman, E. C. Bullard, and H. Jeffreys.

4230. SEZAWA, Katsutada, "Anomalous Dispersion of Elastic Surface Waves," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 225-233, 5 fig., bib., Tokyo, June, 1938. K.S.

4231. SEZAWA, Katsutada, and KANAI, Kiyoshi,

(1) "Gravitational Stability of the Earth at Its Liquid Cooling Stage," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 234-243, 4 fig., bib., Tokyo, June, 1938.

(2) "The Effect of Cooling on a Plastic Earth under Gravitational Forces," *Ibid.*, 244-255, 2 fig., bib. K.S.

(3) "Anomalous Dispersion of Rayleigh-waves," *Proc. Imp. Acad.*, Vol. 14, No. 7, 246-249, 2 fig., bib., Tokyo, July, 1938.

- SHEPARD, E. R., "Electrical Resistivity and Seismic Exploration for Road Beds and Other Engineering Structures" (abstract only). See No. 4213 of this list.

4232. SHEPARD, Francis P., "The Enigma of the Submarine Canyons," *Scien. Amer.*, Vol. 159, No. 3, 130-132, 6 fig., New York, Sept., 1938.

Geologists debate the mystery as to the cause of the vast submarine canyons, comparable with the Grand Canyon of the Colorado.

- SHOENBERG, D., "Statistical Physics." See No. 4189 of this list.

4233. SHOUMILIN, S. V., "Geophysical Methods of Prospecting in Soviet Union Oil Industry," *Pan-Amer. Geol.*, Vol. 70, No. 1, 30-31, Des Moines, Aug., 1938.

4234. SIÑERIZ, J. G., "La investigación sísmica en el estrecho de Gibraltar," *Acad. cien, Madrid Rev.*, Vol. 32, 431-476, 1935.

An abstract by Ayvazoglou appears as No. 3861, pp. 111, 112, of *Geoph. Abst.* 90, reported as No. 4140 of this list.

4235. SMIT SIBINGA, G. L., "Additional Note on the Relation between Deep-focus Earthquakes, Gravity and Morphology in the Netherlands East Indies," *Ger. Bei.*, Bd. 53, Heft 4, 392-394, bib., Leipzig, 1938.

Author's abstract: "The more exact data recently published by Gutenberg and Richter support the main conclusion of the writer regarding the relationship between deep-focus earthquakes, surface geology and gravity. It is not clear however on which facts Visser's opinions are based."

See article by Visser reported in this issue of the *Bibliography*.

4236. SOCIÉTÉ DE PROSPECTION ÉLECTRIQUE, "Verfahren und Anordnung zum Erkennen der von einem Bohrloch durchsunkenen Gebirgsschichten" (patent). Germany, No. 644,899, May 15, 1937. See No. 3932, p. 134, of *Geoph. Abst. 90*, reported as No. 4140 of this list.

4237. SOCIETY OF ECONOMIC GEOLOGISTS, "Annotated Bibliography of Economic Geology," Vol. 10, No. 2, i-viii+235-446, Urbana, Ill., July, 1938.

Nos. 1152-1190 of the items reviewed deal with geophysical prospecting, Nos. 1171-1185, pp. 402-405 being devoted to seismic prospecting.

4238. STEINMANN, Kurt W., "Geophysical Work Maintains Important Coastal Standing," *Oil Weekly*, Vol. 90, No. 7, 114-118, Houston, July 25, 1938.

A brief review of recent geophysical work in the Gulf Coast region of Louisiana and Texas. J.H.H.

— STETSON, H. C., "Present Status of Submarine Canyons," See No. 4166 of this list.

4239. STIPE, C. G., and KELLY, S. F., "Geophysical Methods Aid Construction Work," *Civil Engineering*, Vol. 7, No. 4, 264-268, Easton, Pa., April, 1937.

4240. STÖCKE, K., HERRMANN, H., and UDLUFT, H., "Gebirgsdruck und Plattenstatik, Teil 2: Elastizitätsversuche an Gesteinen aus Niederschlesien und Westfalen." *Zeit. Berg-Huten- und Salinenwesen Deutsch. Reich.*, Vol. 84, No. 11, 467-503, Berlin, 1937.

A lengthy abstract by Ayvazoglou appears as No. 3864, pp. 112-113, of *Geoph. Abst. 90*, reported as No. 4140 of this list.

Part 1 of the above paper was reported as No. 2830 of these lists.

4241. STONELEY, Robert, "Note on the Eureka Earthquake of June 6, 1932," *Bul. S.S.A.*, Vol. 28, No. 3, 191-195, bib., Berkeley, July, 1938. E.T.

4242. TABOR, L. L., "Earthquake of February 4, 1938, in Colombia," *Bul. S.S.A.*, Vol. 28, No. 3, 227-229, Berkeley, July, 1938.

— TAKAYAMA, Takeo, and NISHIMURA, Genrokuro, "Seismic Waves due to Traction Applied to the Inner Surface of a Spherical Cavity in an Elastic Earth." See No. 4210 of this list.

4243. TAYLOR, ROCHESTER, "Fathoming Out the Ocean," *Taylor, Rochester*, First Quarter, 1938, p. 24, 6 illus., Rochester, 1938.

The above short article in the publication of the Taylor Instrument Co. outlines the methods now in use to sample the ocean floor.



4244. THYSSSEN, St. v., HUMMEL, J. N., and RÜLKE, O., "Über das Wesen des seismisch-elektrischen Effektes," *Bei Angew. Geoph.*, Bd. 7, Heft 3, 209-217, 7 fig., bib., Leipzig, 1938.

The authors' abstract reads: "In this paper the authors prove that there is a close relation between the seismic-electric effect and electro-chemical polarisation. It seems that by elastic deformation of the electrolyte depolarisation will be increased. Using a seismograph constructed according to the principles of the seismic-electric effect it is not possible to give a true to nature reproduction of elastic deformations of the ground."

4245. TSUBOI, Chuji, "A Simple Method of Approximately Determining the Thickness of the Isostatic Earth's Crust," *Bul. Eq. Res. Inst.*, Vol. 16, Part 2, 285-287, Tokyo, June, 1938.

4246. TYDEMAN, G. F., "The Birth of Earth and Moon," E. J. Brill, Publisher, 44 pp., 2 pl., Leiden, 1937.

The table of contents reads as follows: Origin of the earth; Origin of the moon; Decay, death, and destruction of the earth; The fluidity of the earth's core; Corroboration of the core's fluidity by seismic phenomena; Appendix; Summary.

The author, in his preface, says: "Doubtless some of the contents of this booklet will be called heretic, but as to this we may refer to the words of one of our deceased, well known scientists: 'It does not matter whether a theory will prove to be true in the end, if it only induces others to study or research'."

G.F.T. + E.J.B. + J.F.S.

- UDLUFT, H., STÖCKE, K., and HERRMANN, H., "Gebirgsdruck und Plattenstatik, Teil 2: Elastizitätsversuche an Gesteinen aus Niederschlesien und Westfalen." See No. 4240 of this list.

4247. ULRICH, Franklin P., "Progress Report for 1937 of the Seismological Field Survey of the United States Coast and Geodetic Survey," *Bul. S.S.A.*, Vol. 28, No. 3, 205-215, 5 fig., Berkeley, July, 1938.

4248. Van RYSINGE, C., "Zijn aardbewingen als oorlogswapen te gebruiken?" (May earthquakes be used as weapons of war?), *Haagsch maandblad*, Vol. 15, No. 7, 35-42, Leiden, July, 1938.

The author after considering the various aspects of the subject concludes that the answer to the above question must be in the negative. J.F.S.

- VASILEV, M. V., and POSPELOV, P. A., "Experimental Seismic Tests of the Reflected Wave Method in the Apsheron-Khodyzhenskoi Region." See No. 4216 of this list.

4249. VISSER, S. W., "Seismic Isobaths in the East Indian Archipelago," *Ger. Bei.*, Bd. 53, Heft 4, 389-391, bib., Leipzig, 1938.

Author's abstract: "The seismic isobaths in the Netherlands East Indies constructed by Smit Sibinga are discussed. His results have no real value; on the contrary they give a false impression of certainty; they are not supported by the investigation of Gutenberg and Richter. A possible connection with Vening Meinesz's gravity anomalies is discussed."

See article by Smit Sibinga reported in this issue of the *Bibliography*.

4250. WALLACE, Irving, "The Unlucky City (Antigua, Mexico)," *Can. Geog. Mag.*, Vol. 17, No. 3, 127-129, 6 illus., Ottawa, Sept., 1938.
4251. WATERS, H. H., and CAMPBELL, D. A., "A Simple Method of Recording Radio Time-signals on a Chronograph," *Jour. Brit. Ast. Ass.*, Vol. 48, No. 9, 356-358, 1 fig., London, July, 1938.
4252. WEICKMANN, L., and MILDNER, P., "Die in den Jahren 1931 bis 1935 in Leipzig und im Observatorium am Collnberg aufgezeichneten Erdbeben," *Berichte der mathematisch-physischen Klasse der Sächsischen Akademie der Wissenschaften zu Leipzig*, Bd. 89, 205-346, 14 fig., 4 pl., tab., Leipzig, 1937.
4253. WEICKMANN, L., *et al.*, "Bericht zur 25-Jahr-Feier des Geophysikalischen Instituts der Universität Leipzig; das Geophysikalische Observatorium," *Veröff. Geoph. Inst. Univ. Leipzig*, Series 2, Bd. 10, 171 pp., Leipzig, 1938.  
The publication contains 16 articles by L. Weickmann, P. Mildner, H. Lettau, G. Fritzsche, and R. Lauterback. Those of particular interest to seismologists are listed in this issue of the *Bibliography* under the names of Mildner, Lettau, and Fritzsche.
4254. WESTLAND, A. J., S.J., "Thirteenth Annual Meeting of the Eastern Section of the Seismological Society of America, Cambridge, Mass., May 2 and 3, 1938," *Bul. S.S.A.*, Vol. 28, No. 3, 234-235, Berkeley, July, 1938.  
See also No. 4148 of this list.
4255. WHIPPLE, F. J. W., *et al.*, "Seismological Investigations: Forty-third Report of the Committee of Seismological Investigations," British Association, Sec. A, Cambridge Meeting, 1938.  
The report as issued in reprint form occupies seven pages. The section headings are: Meeting of the Committee; The Gray-Milne Fund; Seismographs; Geocentric co-ordinates; British earthquake inquiry; Belgian earthquake of June 11, 1938; Seismology at Kew Observatory; Seismology in the West Indies; International Seismological Summary (J. S. Hughes); Work on transmission times and on periodicity (H. Jeffreys).  
E.T.
4256. WILLIS, Bailey, "San Andreas Rift, California," *Jour. Geol.*, Vol. 46, No. 6, 793-827, 7 fig., bib., Chicago, Aug.-Sept., 1938.
- WISEMAN, J. D. H., "The Topography of the Ocean Floor," See No. 4229 of this list.
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