M.O. 330
(Richmond)

Air Ministry

METEOROLOGICAL OFFICE

THE OBSERVATORIES' YEAR BOOK 1929

Comprising the meteorological and geophysical results obtained from autographic records and eye observations at the observatories at Lerwick, Aberdeen, Eskdalemuir, Cahirciveen (Valentia Observatory), and Richmond (Kew Observatory), and the results of soundings of the upper atmosphere by means of registering balloons.

RICHMOND (KEW OBSERVATORY)

Published by the authority of the
METEOROLOGICAL COMMITTEE

LONDON:
PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

1931

RICHMOND (KEW OBSERVATORY).

Latitude	51° 28′ N.
Longitude	0° 19′ W.
G.M.T. of Local Mean Noon	12h 1m.

Heights in Metres above Sea Level.

Barometer	10·4
Raingauge Site	5·5
Robinson Cup Anemograph	25
Dines Tube Anemograph	25

Heights in Metres above Ground.

Thermometer Bulbs	3·0
Sunshine Recorder	13·3
Robinson Cup Anemograph	20
Dines Tube Anemograph	20
Beckley Raingauge Rim	0·53

INTRODUCTION.

The Observatory was built in 1769 as the private observatory of King George III. Since 1842 it has been devoted to physics and meteorology. The meteorological records are continuous from 1854. The Observatory is in the Old Deer Park Richmond (Surrey), about 10 miles (16 km.) to the west of the City of London. The Observatory stands on a low artificial mound whose level is about 1½ metres higher than that of the surrounding park. Round the Observatory a golf course has been laid out. The river Thames is distant about 300 metres on the north and west. Kew Gardens, which are extensively wooded, lie to the east-north-east, the nearest point of the Gardens being about 600 metres away. The town of Richmond, to the south-east, is about 1,100 metres distant. On the east side of the Park is the main road from Richmond to Kew; on the south side the railway from Richmond to Twickenham. An open area partly wooded, Syon Park, lies to the north-north-east across the river. Richmond Park is about 1½ miles (2½ km.) to the south-east. General views of the Observatory building and the exposure lawn are to be found in the 1928 volume. The photographs were taken in 1925, but the only changes (before the end of 1929) which need be noted are the substitution of other experimental screens for the small marine screens which were being tested in 1925, and the removal in 1929 of the hedge near the North-wall screen. For the early history of the Observatory reference may be made to papers by S. P. Rigaud (The Observatory 1882, p. 279), R. H. Scott (Royal Society's Proceedings, Vol. 39 (1885), pp. 37–86), C. Chree (The Record of the Royal Society, 1897), and R. S. Whipple (Proceedings of the Optical Convention, 1926).

METEOROLOGY.

The elements dealt with in the following tables are: atmospheric pressure, temperature, humidity, rainfall, sunshine, solar radiation, wind speed and direction, earth temperature, minimum temperature on the grass, level of underground water; there is also a diary of cloud and weather.

For brief descriptions of most of the instruments from which values of the above elements have been obtained and of the methods of tabulating the records, reference should be made to the General Introduction. The following notes supplement, where necessary, the information contained therein.

In interpreting the observations it is to be borne in mind that even in pure mountain air the greater part of the electric charge is carried by the sluggish "Langevin" ions. In less pure air a still higher proportion of the ions is immobilised and there is a decrease in the number of the small ions, i.e., of ions such as are most effective in producing the conductivity of the atmosphere.

As is usual at Kew the highest values of the measured ionization occurred during the summer half of the year. The averages for the year were + 65 and − 48 × 10^{-18} coulomb per c.c. According to Millikan's experiments* the ionic charge is 15·9 × 10^{-20} coulomb, so that these averages correspond respectively with 400 positive and 300 negative ions per c.c. These averages are much lower than those obtained in clean country air. According to Bauer and Swann† the means for the principal observations reported at land stations before 1917 were 737 positive and 668 negative ions per c.c.

ATMOSPHERIC POLLUTION.

The Owens atmospheric pollution recorder or air filter No. 1‡ is situated in the Clinical House, and the level of the intake is about 1½m. above that of the adjacent ground. The weight of the pollution is not obtained directly but is deduced from shade numbers 0, 1, 2, etc., assigned to the deposit left on the filter paper through which the air is drawn. The equivalents of the shade numbers are allotted in accordance with the results of an investigation carried out for the Atmospheric Pollution Committee by Mr. J. G. Clark.§ When the normal volume of air, 2 litres, is aspirated (it is drawn through a hole 3·2 mm. in diameter) shade number 1 answers to 0·32 milligrams per cubic metre. The Owens apparatus was designed in the first place for dealing with the air of cities and the amount of pollution at the Observatory is usually so small that the shade recorded when the 2 litres are aspirated is either 0 or 1.

Preliminary experiments with a spare recorder having justified the assumption that increasing the volume of air would increase the shade number in proportion an auxiliary tank was brought into use at the beginning of July, 1928. With this tank in operation each spot on the filter paper corresponds with 6·4 litres of air. The unit shade is therefore equivalent to 0·1 mg./m³. When fog prevails the auxiliary tank is put out of action and the unit shade reverts to the value 0·32 mg./m³.

This improvement in the recording system must of itself introduce a discontinuity in the published data. It is anticipated however that the results will be much more reliable.

In this connection it is to be noted that new scales of shades were taken into use on the following dates:—

June 7, 1925; July 1, 1926; and (retrospectively) January 1, 1928.

The highest estimate of pollution was 4·8 mg./m³ on November 15th at 17h. There were 43 days on which the pollution reached 1·0 mg./m³; the number of hours credited with 1·0 mg./m³ or more being 312. The months in which these days and hours occurred are given in the table in the margin.

	days	hours
Jan.	6	49
Feb.	14	100
Mar.	14	112
Nov.	6	43
Dec.	3	8
	43	312

Table 543 gives mean hourly values derived from all the days of the month for which complete records were obtained. There were 353 such days in the year. The highest and lowest of these hourly values are in heavy type.

---

* Phil. Mag. (6) 34 (1917) 3.

† Washington, Carnegie Institution. *Researches Dept. of Terr. Mag.*, Vol. III (1917) p. 411.

‡ A description of the instrument is given in the *Report of the Advisory Committee for Atmospheric Pollution*. 4th Report, 1917–1918 (p. 20).

§ London, M.O. *Report of the Advisory Committee for Atmospheric Pollution*. 3rd Report, 1916–1917, (p. 20).

Table 544 gives diurnal inequalities derived from the data in Table 543 after the application of non-cyclic corrections. The principal reason for computing the diurnal inequalities was to facilitate comparison with the corresponding diurnal variations in barometric pressure and the potential gradient of atmospheric electricity.

The mean values computed for the several years since the recorder has been in operation are given in the following table, together with the means for the summer months (May to August) for the equinoctial months (March, April, September, October) and for the winter months. The unit is 1 mg/m³.

	1921	1922	1923	1924	1925	1926	1927	1928	1929
Summer	·13	·27	·27	·25	·15	·08	·06	·07	·06
Equinox	·27	·45	·30	·50	·24	·25	·13	·15	·18
Winter	·53	·46	·35	·39	·39	·27	·24	·23	·30
Year	·31	·39	·31	·32	·26	·20	·14	·15	·18

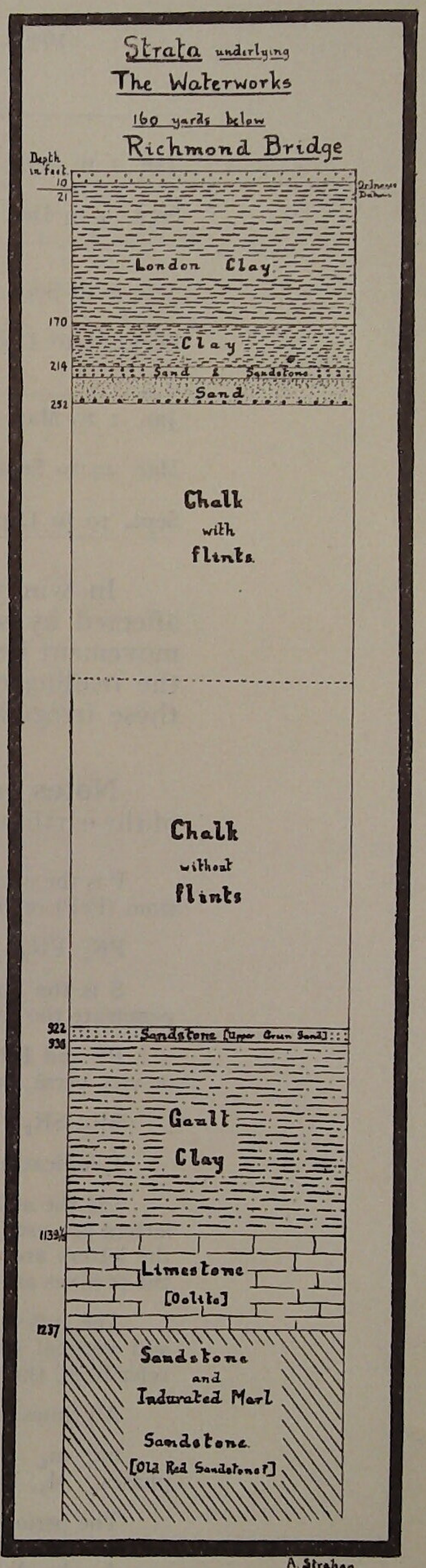
In any discussion of these mean values it should be borne in mind that before the introduction of the auxiliary tank the great majority of estimates were shade 0 or shade 1. To discriminate between these two shades is difficult, and the decision depends on the " personal equation " of the observer as well as on the colour of the scale of shades. Some change in standard from year to year has been inevitable.

The nature of the diurnal variation is most easily recognised in Table 544. There is always a well defined minimum during the night and another in the early afternoon. The first maximum of the day usually occurs about 9h and the second one follows about 12 hours later. This double oscillation is apparently due to two causes, the variation in human activity in producing pollution and the variation in the wind which disperses it. In 1929 the principal maximum was in the afternoon in April and from October to December; in the forenoon in the remaining months. The principal minimum occurred in the afternoon from March to September; in the early morning in the remaining months. Curves illustrating the diurnal variation of atmospheric pollution will be found in the Annual Reports of the Advisory Committee on Atmospheric Pollution and in a paper by Dr. F. J. W. Whipple in the Quarterly Journal of the Royal Meteorological Society, Volume 55 (1929), No. 231.

SEISMOLOGY.

Notes on Instruments.—The seismographs, three Galitzin pendulums with galvanometric registration, were transferred from Eskadelmuir Observatory during the latter part of 1925 and have been in regular operation since the beginning of 1926. Earth movements in the north, east and vertical directions are recorded. The pendulums, which are in the old magnetograph room, are mounted on a massive concrete pillar, separated from the floor. The galvanometers and recording apparatus are accommodated on slate slabs in the old seismograph room, which housed the Milne instrument until it was put out of action on June 17th, 1925. To eliminate temperature variation as far as possible, the windows of the pendulum room are provided with triple glass and also shielded by louvred screens from direct sunshine which might fall on them morning and evening. The annual range of temperature variation is about 10° C. and the mean daily range about 0·2° C.

The concrete pillar rests on gravel. The underlying geological strata are shown in the diagram on this page. The diagram is based on the results obtained * in sinking a well near Richmond Bridge. The Richmond boring terminated at a depth of 440 metres in Old Red Sandstone. At Stonebridge Park, 8 km. to the north, a boring was carried down † to a depth of 600 metres, the last 280 metres being in Old Red Sandstone. There is no information as to deeper strata near Richmond. It may be noted, however, that the sandstone beds dip at about 30° and that a boring at Little Missenden, Bucks, entered Silurian rocks at a depth of 370 metres with no evidence of the presence of Old Red Sandstone.



For detailed description of the Galitzin seismograph and for particulars of interpretation of the records, reference may be made to Fürst B. Galitzin's "Vorlesungen über Seismometrie" (Leipzig, 1914), or to G. W. Walker's "Modern Seismology" (London, 1913).††

Timing is controlled be a half-seconds clock (Morrison 8587) which is rated daily by comparison with the Greenwich wireless time-signal relayed from Daventry. Time breaks are made electro-magnetically every minute and seismometric readings can be determined to the nearest second.

The free periods of the galvanometers (T_1), were determined in November, 1925, and were found to have suffered very little change since the original determinations at Eskdalemuir were made. The lengths of the simple equivalent pendulums (l), are assumed to have remained unaltered. These constants are as follows:—

	N	E	Z
T_1	24·68 sec.	24·80 sec.	13·04 sec.
l	118 mm.	118 mm.	360 mm.

N, E, and Z indicate the north, east and vertical components respectively.

The values of the other constants which are used for deriving the scale values were determined in March and September for the vertical pendulum, and in September for the horizontal instruments. In the case of the horizontal instruments it was found that the magnifications agreed closely with those obtained from the previous tests in June, 1928. In order to diminish the sensitivity of the vertical pendulum to temperature changes the steel controlling spring was replaced in May, 1928, by one made of elinvar, an alloy which has a temperature coefficient of elasticity about one tenth that of steel.‡ A detailed report on the behaviour of the spring has been published in a paper § by F. J. Scrase. The difficulties usually associated with the operation of the vertical pendulum have been greatly diminished. Some adjustments to the vertical pendulum were carried out on September 10th.

The table given below summarises the values of the constants obtained from the standardisation tests. T is the free period of the pendulum, μ is a damping co-efficient which vanishes when the free movement of the pendulum is just aperiodic, A is the length of the beam of light from the galvanometer mirror to the recording drum (usually about 1100 mm), and k is the "transmission" factor. The quantity $\frac{kA}{\pi l}$ may be regarded as a relative measure of the nominal magnification. $\frac{kAT}{4\pi l}$ is the magnification factor for regular earth movements with a period equal to that of the pendulum.

---

* London. J. Geological Soc., Vol. 40 (1884), Vol. 41 (1885), p. 523.
† Records of London Wells, Mem. Geol. Survey 1913.
†† The graphical method adopted at Kew for determining the constants of the pendulums is explained in a memoir by F. J. Scrase. Geophysical Memoir No. 49. (1930).
‡ Y. Dammann, "Contribution à l'étude des propriétés élastiques de l'élinvar. Son utilisation dans les séismographes." Publications du Bureau Central Séismologique International, Série A, Fascicule No. 5, pp. 122–129, 1927.
§ J. Sci. Instruments, Vol. VI., No. 12 (1929), p. 385.

1929	Component	T	μ^2	$\frac{kA}{\pi l}$	$\frac{kAT}{4\pi l}$
		sec.		sec.$^{-1}$	
Jan. 1 to Sept. 9 ..	N	24·8	−0·01	46·9	291
Sept. 9 to Dec. 31 ..		25·5	0·00	46·8	298
Jan. 1 to Sept. 10 ..	E	24·7	+0·02	43·3	267
Sept. 10 to Dec. 31 ..		24·7	+0·09	43·5	268
Jan. 1 to Mar. 20 ..	Z	14·2	+0·08	112	398
Mar. 20 to Sept. 10 ..		12·5	+0·11	112	350
Sept. 10 to Dec. 31 ..		12·9	+0·10	113	364

In windy weather the seismographs, especially the horizontal components, are affected by slow oscillations, which are attributed to the tilting of the ground, the movement being conveyed through the foundations of the Observatory. On occasions the reading of an earthquake record is rendered very difficult, if not impossible, by these irregular disturbances.

Notes on Tables.—The *Seismological Diary*, Table 545, contains the particulars of the earthquakes recorded at the Observatory. The notation employed is as follows :—

P is the normal first phase (longitudinal waves). Special cases of P occur when the waves are reflected from (PcP) or penetrate (P′) the earth's central core.

PR_1, PR_2 . . . are longitudinal waves reflected once, twice . . . near the earth's surface.

S is the normal second phase (transverse waves). ScPcS is a special case of S in which the wave penetrate the central core and pass through it as longitudinal vibrations.

PS and PPS are waves which suffer a change or changes from longitudinal to transverse oscillation or vice versâ, on reflection near the surface.

SR_1, SR_2 . . . are transverse waves reflected once, twice . . . near the surface.

L indicates long waves (surface waves).

i is the sudden commencement of a phase. *e* means a gradual or indistinct commencement. These letters are used as prefixes to the phase symbols, but where the character of the phase is not assignable the letters are used as independent symbols. When the commencement of a phase is moderately clear the prefixes are not used.

The suffixes N, E, Z indicate that the estimates refer to the records from the north-south, east-west and vertical seismographs respectively. The absence of all these suffixes indicates that the estimates refer to all three records.

All times entered against the above phases are the times of arrival of the phases at the station.

m_1, m_2 . . . are successive prominent maxima of sinusoidal waves occurring in the preliminary phases. M_1, M_2 . . . are successive prominent maxima occurring during the principal or surface phase.

The period is the duration of a double oscillation (to and fro movement).

A_N, A_E, A_Z are the amplitudes, in microns (μ=0·001 mm.), of the components of the true displacement of the ground from the position of rest. Displacements to the north, east and upwards are regarded as being positive. When successive positive and negative displacements have the same magnitude the time of occurrence is given for the positive one. When no sign is given the measurement refers to a long group of waves the amplitudes of which are the same.

The following formulæ due to Galitzin are employed for computing the times of the maxima and the amplitudes of sinusoidal waves :—

(1) Lag of the displacement shown by the galvanometer after the maximum displacement of the ground

$$\tau+\tau_1=\frac{T_p}{2\pi}\left[\tan^{-1}\frac{2u\,(1-\mu^2)^{\frac{1}{2}}}{u^2-1}+\tan^{-1}\frac{2u_1}{u_1^2-1}+\frac{\pi}{2}\right]$$

each inverse tangent being taken as between o and π.

(2) Magnification of record =

$$\frac{k\,A\,T_p}{\pi l}\cdot\frac{1}{(1+u^2)(1+u_1{}^2)\{1-\mu^2 f(u)\}^{\frac{1}{2}}}$$

where T_p is the period of the earth wave considered,

$$u=\frac{T_p}{T},\quad u_1=\frac{T_p}{T_1},\quad \text{and } f(u)=\left[\frac{2u}{1+u^2}\right].$$

Δ is the distance in kilometres of the epicentre measured along the arc of the great circle passing through the station. This distance is derived from the interval between P and S, by the tables, due to Zeissig, given in Klotz's "Seismological Tables" (Publication of the Dominion Observatory, Ottawa, Vol. III, No. 2). The azimuth of the epicentre (0° to 360°) is measured from north through east. When an estimation of the azimuth is possible, it is used, together with Δ, for provisional determination of the co-ordinates of the epicentre. In other cases where co-ordinates are given, the information has been obtained from other sources ; the origin of the determination is inserted in brackets.

Brackets enclosing figures or phase symbols indicate that the information is uncertain.

The Diary contains some amendments to the information which has already been issued in the Observatory Seismological Bulletin. Attention is drawn to revised readings for the disturbance on June 3rd, in which case misinterpretation of the phases led to an estimate of the epicentral distance which was quite incompatible with information received subsequently.

The total number of shocks recorded during the year was 320. The phases being sufficiently well defined, estimates of the epicentral distances were obtained for 74 shocks, whilst in 6 cases the records of the initial impulses were sufficiently sharp to allow of computations of azimuth and so of estimates of the co-ordinates of the epicentres. There were 12 earthquakes which produced a disturbance at the observatory with an amplitude exceeding 0·1 mm. in a horizontal component. These earthquakes originated in the Sea of Okhotsk (January 13th), in the Atlantic Ocean (February 22nd, June 27th, November 18th), near the Aleutian Islands (March 7th, July 7th—8th, December 17th), in Persian Turkestan (May 1st), in Asia Minor (May 18th), in the Pacific Ocean near Alaska (May 26th—27th), in New Zealand (June 16th—17th), and near the Caroline Islands (November 15th).

For comparison the statistics for all the years in which the Galitzin seismographs have been in operation at Kew Observatory are given :—

	Shocks recorded.	Epicentral distances.	Azimuths. estimated	Shocks exceeding 0·1 mm.
1926	306	55	—	10
1927	314	78	6	9
1928	339	97	19	18
1929	320	74	6	12

Microseisms.—In Table 545 are given the amplitude (A) and period (T_p) of the microseisms shown by the north component seismograph on each day at oh, 6h, 12h, and 18h.* On a few occasions (less than 2 per cent. of the total number) when the north component record was not available measurements of the east component

* For the year under review microseisms were measured at eight hours daily (oh., 3h., 6h.—etc. with a view to investigation of diurnal variation.

record have been included. The group of waves of greatest amplitude occurring in the 30 minutes centering at the hour in question is selected, and the amplitude tabulated is the mean obtained from the three largest complete waves in that group. The period is derived from a measurement made on the same group, but the procedure adopted in 1926 and 1927 was slightly modified from January 1st, 1928, in order to diminish the tendency on the part of the tabulator to give preference to certain periods.* The total time, to the nearest second, for a number of complete consecutive waves is measured, the number of waves being chosen so that the time is between 23 and 30 seconds. The period is then derived from the following division table :—

Number of Waves.	Time interval in seconds.							
	30	29	28	27	26	25	24	23
3	10	9·7	9·3	9·0	8·7	8·3	8·0	7·7
4	7·5	7·3	7·0	6·7	6·5	6·3		
5	6	5·8	5·6	5·4	5·2			
6	5	4·8	4·7	4·5				
7	4·3	4·1	4·0	3·9				
8	3·7	3·6	3·5					
9	3·3	3·2	3·1					
10	3·0	2·9	2·8					
11	2·7	2·6						
12	2·5							

In computing the mean period occasions of zero amplitude are omitted. The mean values of amplitude and period for each month of 1929 and for the year, together with the corresponding values for 1926, 1927 and 1928 are given below :—

MICROSEISMS—MONTHLY AND ANNUAL MEANS.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1926.													
Amplitude (μ)	2·3	1·7	1·8	1·1	0·5	0·4	0·5	0·6	0·5	0·8	1·7	1·6	1·1
Period (secs.)	6·3	6·5	6·5	5·6	4·7	4·6	4·6	4·7	5·2	4·9	6·1	6·2	5·5
1927.													
Amplitude (μ)	2·8	1·6	1·7	1·1	0·5	0·6	0·5	0·8	0·9	1·1	1·9	2·5	1·3
Period (secs.)	6·6	6·1	5·8	5·5	4·5	4·6	4·0	4·7	4·8	5·1	6·1	6·3	5·3
1928.													
Amplitude (μ)	2·9	2·6	1·3	1·1	0·4	0·8	0·4	0·7	0·7	1·4	2·1	1·6	1·3
Period (secs.)	7·1	6·7	5·6	5·5	4·6	4·6	4·7	4·3	5·0	5·9	6·0	6·0	5·5
1929.													
Amplitude (μ)	1·5	2·1	1·1	0·8	0·8	0·6	0·4	0·6	0·9	1·4	2·1	3·0	1·3
Period (secs.)	6·3	5·8	6·1	5·0	5·0	4·4	3·9	4·1	5·2	5·1	6·0	6·8	5·3

* F. J. W. Whipple and F. J. Scrase, "On the Frequency of Microseisms of Different Periods at Eskdalemuir and at Kew." Mon. Not. R.A.S., Geophys. Suppl. II. No. 2 (1928).

SEISMOLOGICAL DIARY: *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Jan.		h. m. s.	s.	μ	μ	μ	km.	
2	eL	3 21	...	...	...	...	...	
	F	30	...	...	...	...	...	
4	$e(L)_E$	21 10 2	...	...	...	...	...	Very small.
	$e(L)_{NZ}$	10	...	...	...	...	...	Felt at Fez, Morocco.
	F	10·8	...	...	...	...	...	(Strasbourg).
6	eL	0 10	...	...	...	...	...	
	F	25	...	...	...	...	...	
8	eL	8 15	...	...	...	...	...	
	F	9 0	...	...	...	...	...	
11	eL	2 1	...	...	...	...	...	Very small.
	F	5	...	...	...	...	...	Felt at Oran, Algeria.
								(Strasbourg).
13	iP	0 14 48	...	...	...	...	8260	Dilatation.
	i	15 39	...	...	...	...	...	Amplitudes of iP as
	PR_1	17 44	...	...	...	...	...	read in mm.—
	i	18 36	...	...	...	...	...	N-S. E-W. Z.
	PR_2	19 37	...	...	...	...	...	+9·4 +3·0 −14
	PR_{3NZ}	21 33	...	...	...	...	...	Azimuth = 19° ± 1°.
	iS_{NE}	24 21	...	...	...	...	...	Sea of Okhotsk, 53° N,
	iPS	25 25	...	...	...	...	...	149° E.
	iN	27 10	...	...	...	...	...	(Strasbourg).
	iSR_{1NE}	30 18	...	...	...	...	...	
	L_E	35 59	28	...	...	...	...	
	M_1	37 5	33	...	−360	...	...	
	L	40·6	(50)	...	...	...	...	
	M_2	41 13	47	+930	...	...	...	Note very prominent
	M_3	41 47	45	...	...	+680	...	maxima with long
	M_4	46 4	26	...	+190	...	...	periods.
	M_5	47 14	26	+195	...	...	...	
	M_6	49 24	24	−230	...	...	...	
	M_7	50 31	26	...	+180	...	...	
	M_8	58 28	15	...	...	−80	...	
	F	4 30	...	...	...	...	...	
13	eL	16 34	...	...	...	...	...	
	F	17 0	...	...	...	...	...	
13	eL	19 21	...	...	...	...	...	
	F	45	...	...	...	...	...	
14	eL	3 3	...	...	...	...	...	
	F	20	...	...	...	...	...	
14	eLz	5 43	...	...	...	...	...	Traces on N-S and
	F	55	...	...	...	...	...	E-W components.
16	e(P)	8 19 36	...	...	...	...	(10800)	Philippine Islands.
	e(ScPcS)	30 11	...	...	...	...	...	16·5° N, 120·7°
	i(PS)	32 8	...	...	...	...	...	(J.S.A.).
	L	53	...	...	...	...	...	
	M	57 34	25	+24	...	...	...	
	F	9 45	...	...	...	...	...	
17	e	0 16	...	...	...	...	...	Very small.
	F	25	...	...	...	...	...	Ionian Sea near 38° N,
								19·5° E. (Strasbourg).
17	ePz	11 56·6	...	...	...	...	(7500)	Destructive at Cumana,
	eS_E	12 5·3	...	...	...	...	...	Venezuela.
	PS_E	5 47	...	...	...	...	...	11° N, 64° W. (U.S.C.
	e_E	8 24	...	...	...	...	...	and G.S.).
	SR_{1E}	9 30	...	...	...	...	...	
	SR_2	12 56	...	...	...	...	...	
	L_N	13·4	40	...	...	...	...	
	L_{EZ}	16	30	...	...	...	...	
	M_1	17 19	28	−78	...	...	...	
	M_2	17 30	29	...	+92	...	...	
	M_3	19 5	25	...	...	+84	...	
	M_4	19 17	24	...	−77	...	...	
	F	14 (15)	...	...	...	...	...	
17	eL	23 26	...	...	...	...	...	
	F	0 0	...	...	...	...	...	
18	$e(S)_N$	21 44 40	...	...	...	...	...	
	L_N	53	...	...	...	...	...	
	L_{EZ}	56	...	...	...	...	...	
	F	22 25	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Jan.		h. m. s.	s.	μ	μ	μ	km.	
19	eL	3 55	...	...	...	...	...	
	F	4 25	...	...	...	...	...	
20	ePR_{1Z}	15 13 31	...	...	...	...	(13000)	Disturbed by micro-
	$(PS)_E$	22 59	...	...	...	...	...	seisms.
	$(SR_1)_N$	34 41	...	...	...	...	...	
	L_{NE}	58	...	...	...	...	...	
	F	16 15	...	...	...	...	...	
21	eL	6 12						
	F	7 10						
21	P_{NZ}	10 41 18	...	...	...	...	6960	Felt in Fairbanks,
	iS_{NZ}	49 45	...	...	...	...	...	Alaska. 64° N, 152°
	SR_{1N}	54 18	...	...	...	...	...	W. (U.S.C. & G.S.)
	e_E	56·8	(20)	...	...	...	...	
	L	11 1	33	...	...	...	...	
	F	12 0	...	...	...	...	...	
22	—	— — —	...	...	...	...	...	9h 27m to 10h 28m.
								No records.
22	eL	15 7	...	...	...	...	...	
	F	40	...	...	...	...	...	
23	iP_Z	11 19 40	...	...	...	...	2770	N-S. record defective.
	iS_E	24 6	...	...	...	...	...	Epicentre west of Crete
	iS_Z	24 10	...	...	...	...	...	(Strasbourg).
	L_E	26	(35)	...	...	...	...	
	L_Z	29·8	24	...	...	...	...	
	M_{EZ}	31·0	12	...	...	...	...	
	F	35	...	...	...	...	...	
24	P_{EZ}	20 48 50	...	...	...	...	8930	Compression.
	i	49 1	...	...	...	...	...	Pacific ocean, near
	PR_{1E}	52 2	...	...	...	...	...	Guatemala. 12·3° N,
	S	58 57	...	...	...	...	...	90·3° W. (J.S.A.).
	iN	21 3 34	...	...	...	...	...	
	SR_{1E}	4 12	...	...	...	...	...	
	SR_{2NE}	7 48	...	...	...	...	...	
	e_N	10·8	(25)	...	...	...	...	
	L	14·0	(44)	...	...	...	...	
	M_1	16 56	28	...	−58	...	...	
	M_2	23 10	19	...	−75	...	...	
	M_3	24 14	19	+34	...	...	...	
	M_4	26 9	17	...	−81	...	...	
	M_5	26 13	18	...	...	+65	...	
	F	23 30	...	...	...	...	...	
25	e	2 9	...	...	...	...	...	
	F	45	...	...	...	...	...	
27	iS_{NE}	16 24 2	...	...	...	...	(6700)	Pacific Ocean near
	L_{NE}	29·8	...	...	...	...	...	Guatemala. 12·3° N,
	L_Z	31·8	28	...	...	...	...	90° W. (J.S.A.)
	M_1	32 47	(13)	+13	...	...	...	
	M_2	33 10	25	...	+19	...	...	
	F	17 20	...	...	...	...	...	
30	—	— — —	...	...	...	...	...	9h 50m to 10h 34m. No
								records.
30	L	17 50	...	...	...	...	...	
	F	18 20	...	...	...	...	...	
31	eL	18 47	...	...	...	...	...	Pacific Ocean south of
	F	19 10	...	...	...	...	...	Mexico (Strasbourg).
Feb.								
1	iP_{EZ}	17 23 10	...	...	...	...	5350	Compression.
	i	23 16	...	...	...	...	...	Amplitudes of iP as
	i_{EZ}	24 2	...	...	...	...	...	read in mm.—
	i_{EZ}	24 25	...	...	...	...	...	N-S. E-W. Z.
	ePR_1	25 19	...	...	...	...	...	−0·2 −1·9 +6·2
	iPR_2	25 55	...	...	...	...	...	Azimuth = 85° ± 5°.
	e_E	28 27	...	...	...	...	...	Destructive at Kuliab,
	iS_{NE}	30 11	...	...	...	...	...	Turkestan.
	i_E	31 34	...	...	...	...	...	Epicentre 37·5° N,
	i_{NZ}	31 38	...	...	...	...	...	69·5° E. (Strasbourg).
	i_{NE}	32 36	...	...	...	...	...	
	SR_{1NE}	34 19	...	...	...	...	...	
	SR_{2E}	35 0	...	...	...	...	...	
	iL_N	35 24	...	...	...	...	...	
	M_1	36 6	14	+40	...	...	...	
	iL_Z	37 33	14	...	...	...	...	
	eL_E	37 53	24	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Feb.		h. m. s.	s.	μ	μ	μ	km.	
1 cont.	M_3	17 38 19	17	...	...	−45	...	
	M_3	42 19	17	+47	...	...	...	
	M_4	42 44	14	...	+40	...	...	
	F	19 20	...	...	...	...	...	
2	iPz	0 9 59	...	...	...	...	6290	Compression. Atlantic Ocean, 2° S, 23° W. (U.S.C. and G.S.).
	iz	11 1	...	...	...	...		
	(eSE)	17 47	...	...	...	...		
	iSNE	17 51	...	...	...	...		
	iLNE	23 47	(30)	...	...	...	...	
	M_1	24·3	(30)	+60	−65	...	...	
	M_2	34 25	14	−29	...	...	...	
	M_3	0 36 42	11	...	...	+25	...	
	M_4	41 5	19	...	+32	...	...	
	F	4 0	...	...	...	...	...	
3	LNE	3 31·9	...	...	...	...	...	
	MN	42 4	16	−8	...	...	...	
	F	4 0	...	...	...	...	...	
3	e	8 1	...	...	...	...	...	
	F	6	...	...	...	...	...	
3	eLNE	18 43	...	...	...	...	...	$17^h\ 15^m$ to 21^h. z record defective.
	F	55	...	...	...	...	...	
4	eL	11 1	...	...	...	...	...	
	F	15	...	...	...	...	...	
5	eL	4 27	...	...	...	...	...	
	F	40	...	...	...	...	...	
6	eL	3 45	...	...	...	...	...	
	F	55	...	...	...	...	...	
6	iPz	7 0 55	...	...	...	...	8400	Dilatation. Azimuth about NNE. Probably a repetition of 1929 Jan. $13^d\ 0^h$. (Sea of Okhotsk).
	iz	0 56	...	...	...	...		
	iPNE	0 57	...	...	...	...		
	SE	10 35	...	...	...	...		
	PSE	11 41	...	...	...	...	...	
	LNE	25	...	...	...	...	...	A very small disturbance with exceptionally sharp P phase.
	ME	35	20	...	...	...	...	
	F	8 0	...	...	...	...	...	
8	eL	2 44	...	...	...	...	...	
	F	3 10	...	...	...	...	...	
10	eL	4 20	...	...	...	...	...	
	F	30	...	...	...	...	...	
10	ePz	15 51 23	...	...	...	...	(9540)	Compression.
	e(S)E	16 2·0	...	...	...	...	...	Pacific Ocean, south of Mexico. 13·1° N, 99·2° W, (J.S.A.).
	$e(SR_1)_N$	5·8	...	...	...	...	...	
	$e(SR_2)_N$	10·2	...	...	...	...	...	
	L	16	...	...	...	...	...	
	M_1	24 54	19	...	+27	...	...	
	M_2	24 58	19	...	...	+25	...	
	F	17 45	...	...	...	...	...	
13	eL	22 50	...	...	...	...	...	Disturbed by large microseisms.
	F	23 10	...	...	...	...	...	
14	eLNE	15 26	...	...	...	...	...	Traces on Z record.
	MNE	30·8	18	...	...	...	...	
	F	16 10	...	...	...	...	...	
15	eLNE	6 22	...	...	...	...	...	
	F	7 0	...	...	...	...	...	
15	eL	8 40	...	...	...	...	...	Pacific Ocean, near Central America. 11° N, 91° W. (U.S.C. and G.S.).
	ME	47	22	...	...	...	...	
	F	9 30	...	...	...	...	...	
16	eNE	20 37	...	...	...	...	...	Traces on Z record.
	F	22 0	...	...	...	...	...	
18	eNE	19 3 24	...	...	...	...	...	Z record disturbed by microseisms.
	LE	4 46	...	...	...	...	...	
	ME	4 53	(13)	...	−9	...	...	Felt at St. Sebastian, Spain. Epicentre—42·1° N, 2·1° W (Cortuja).
	F	7	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Feb.		h. m. s.	s.	μ	μ	μ	km.	
20	—	— — —	...	...	...	...	...	$4^h\ 30^m$ to $7^h\ 30^m$. No records.
20	ez	21 23 3	...	...	...	...	...	
	iz	24 7	...	...	...	...	...	Traces on N-S record.
	eE	45·3	...	...	...	...	...	
	eE	46 57	...	...	...	...	...	
	F	22 30	...	...	...	...	...	
22	ePz	20 51 4	...	...	...	...	5900	Compression. Amplitudes of iP as read in mm.— N. E. Z. +1·15 +1·8 +3·4 Azimuth = 240° ± 2°. Atlantic Ocean, 10° N, 40° W. (Strasbourg).
	iP	51 9	...	...	...	...		
	iPR_2	53 57	...	...	...	...		
	iz	55 29	...	...	...	...		
	iSE	58 35	...	...	...	...		
	iSN	58 37	...	...	...	...	...	
	iSz	58 40	...	...	...	...	...	
	SR_1	21 2 3	...	...	...	...	...	
	LNE	3 35	(35)	...	...	...	...	
	L	6 8	(28)	...	...	...	...	
	M_1	6 28	(25)	−120	...	...	...	
	M_2	7 11	24	...	+150	...	...	
	M_3	8 25	13	+87	...	...	...	
	M_4	9 44	18	...	...	+110	...	
	M_5	9 48	19	...	−110	...	...	
	M_6	14 48	15	...	...	−90	...	
	M_7	14 50	17	+61	...	...	...	
	M_8	15 25	16	...	+95	...	...	
	F	0 0	...	...	...	...	...	
26	iPz	9 12 20	...	...	...	...	8160	Compression. South of Alaskan Peninsula. 54·8° N, 162·4° W. (J.S.A.).
	iSNE	21 48	...	...	...	...	...	
	SR_1	26 45	...	...	...	...	...	
	LNE	33	...	...	...	...	...	
	MN	43 42	25	+18	...	...	...	
	F	10 40	...	...	...	...	...	
27	eL	20 2	...	...	...	...	...	Disturbed by large microseisms.
	F	10	...	...	...	...	...	
Mar. 1	SR_1	7 55·7	...	...	...	...	...	Epicentre near Vancouver Straits ; 54·1° N, 130·7° W. (J.S.A.).
	eE	59·4	...	...	...	...	...	
	L	8 4	...	...	...	...	...	
	M	11 56	17	+13	...	...	...	
	F	9 30	...	...	...	...	...	
1	e	10 35 44	...	...	...	...	...	
	e	36 9	...	...	...	...	...	
	F	39	...	...	...	...	...	
3	iPEz	16 56 51	...	...	...	...	2420	
	e(S)E	17 0 50	...	...	...	...	...	
	iLE	1 54	...	...	...	...	...	
	M	3 12	20	...	+11	...	...	
	F	30	...	...	...	...	...	
3	eL	18 45·9	...	...	...	...	...	Probably a repetition of the preceding shock.
	ME	47·4	20	...	...	...	...	
	F	55	...	...	...	...	...	
5	eL	16 49	...	...	...	...	...	
	F	17 0	...	...	...	...	...	
7	iPNE	1 46 36	...	...	...	...	8630	Dilatation. Amplitudes of iP as read in mm.— N. E. Z. +9·0 −1·05 — Azimuth : 353° ± 0·5°, giving epicentre near 50·5° N, 169·5° W ; Aleutian Islands. Z record defective.
	iSNE	56 28	...	...	...	...	...	
	iSR_1N	2 1 54	...	...	...	...	...	
	iSR_2N	5 16	...	...	...	...	...	
	iE	7 36	(35)	...	...	...	...	
	iLN	11 50	45	...	...	...	...	
	M_1	13 16	35	−470	...	...	...	
	M_2	16 32	26	...	−230	...	...	
	M_3	19 4	24	+220	...	...	...	
	M_4	20 52	20	+175	...	...	...	
	M_5	23 12	19	...	+220	...	...	
	M_6	2 24 19	20	+210	...	...	...	
	eLz	5 15	...	...	...	...	...	Via the Antipodes.
	M_7	30·7	23	+5	−4	...	...	
	F	6 50	...	...	...	...	...	
8	—	— — —	...	...	...	...	...	10^h to 11^h. No records.

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Mar.		h. m. s.	s.	μ	μ	μ	km.	
9	e(S)NE	2 36 41	...	...	...	...	...	
	L	3 1·6	...	...	...	...	...	No Z record.
	MN	8·7	22	...	...	...	...	
	F	4 10	...	...	...	...	...	
9	eZ	11 13·2	...	...	...	...	...	New Zealand.
	eNZ	29	...	...	...	...	...	43° S., 171·5° E. (Wellington).
	eNE	37·0	...	...	...	...	...	
	LNE	12 3	55	...	...	...	...	
	LZ	12	40	...	...	...	...	
	M_1	25 2	21	+42	...	...	...	
	M_2	26 50	21	...	−40	...	...	
	M_3	28 0	20	...	...	−60	...	
	M_4	34 22	19	+42	...	...	...	
	M_5	34 50	18	...	+37	...	...	
	M_6	35 18	18	...	...	−35	...	
	F	14 0	...	...	...	...	...	
10	eL	1 9	...	...	...	...	...	$9^d\ 17^h$ to $10^d\ 9^h$ and
	F	35	...	...	...	...	...	$10^d\ 14^h$ to $11^d\ 12^h$. No Z record.
10	eNE	14 58·9	...	...	...	...	...	Very distant.
	(L)	15 25	...	...	...	...	...	
	F	16 0	...	...	...	...	...	
10	eL	23 29	...	...	...	...	...	
	F	50	...	...	...	...	...	
11	eLZ	14 5	...	...	...	...	...	
	F	10	...	...	...	...	...	
12	—	— — —	...	...	...	...	...	$10^h\ 30^m$ to $11^h\ 40^m$. No records.
13	eZ	11 10 32	...	...	...	...	...	
	eNE	17 44	...	...	...	...	...	
	F	40	...	...	...	...	...	
14	eL	15 0	...	...	...	...	...	
	F	10	...	...	...	...	...	
14	eL	19 30	...	...	...	...	...	
	F	45	...	...	...	...	...	
15	eL	2 42	...	...	...	...	...	
	F	3 0	...	...	...	...	...	
15	eL	14 3	...	...	...	...	...	
	F	30	...	...	...	...	...	
15	eL	18 15	...	...	...	...	...	
	F	40	...	...	...	...	...	
18	eL	2 45	...	...	...	...	...	
	F	3 10	...	...	...	...	...	
18	eL	15 48	...	...	...	...	...	
	F	55	...	...	...	...	...	
18/19	e(P)Z	23 33 40	...	...	...	...	(9200)	Miyagi, Japan (Kobe).
	e(S)NE	44·0	...	...	...	...	...	
	LNE	0 2·4	40	...	...	...	...	
	LZ	10	...	...	...	...	...	
	ME	10·5	21	...	...	...	...	
	F	45	...	...	...	...	...	
19	eLZ	10 15	...	...	...	...	...	
	F	20	...	...	...	...	...	
19	ePZ	21 5 59	...	...	...	...	(9400)	Z record defective before $21^h\ 4^m$.
	eSNE	6 (30)	...	...	...	...	...	Pacific Ocean, near Central America.
	eSR₁	25·0	...	...	...	...	...	13° N, 91° W. (J.S.A.)
	LN	27·9	...	...	...	...	...	
	LEZ	31·5	...	...	...	...	...	
	ME	36	23	...	...	...	...	
	F	23 45	...	...	...	...	...	
20	—	— — —	...	...	...	...	...	$12^h\ 0^m$ to $16^h\ 44^m$. No records. Standardisation of Z instrument.
20	e(L)	21 56	...	...	...	...	...	
	M	22 10·1	17	...	...	...	...	
	F	23 45	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Mar.		h. m. s.	s.	μ	μ	μ	km.	
21	P	2 49 9	...	...	...	...	(9230)	Compression.
	e(S)E	59 31	...	...	...	...	...	Pacific Ocean, near
	SR₁	3 8·1	...	...	...	...	...	Central America.
	LNE	14·4	40	...	...	...	...	11° N, 90·6° W.
	LZ	18	27	...	...	...	...	(J.S.A.).
	ME	25 51	18	...	−14	...	...	
	F	4 30	...	...	...	...	...	
21	eL	5 12	...	...	...	...	...	
	F	25	...	...	...	...	...	
22	eL	3 45	...	...	...	...	...	
	F	4 10	...	...	...	...	...	
23	eL	20 56	...	...	...	...	...	
	F	21 35	...	...	...	...	...	
26	eE	5 34 33	...	...	...	...	...	Traces on N-S and Z
	F	45	...	...	...	...	...	records.
27	e	21 18	...	...	...	...	...	
	F	30	...	...	...	...	...	
27	e	22 23	...	...	...	...	...	
	F	35	...	...	...	...	...	
28	eL	3 52	...	...	...	...	...	
	F	4 20	...	...	...	...	...	
28	eN	20 44 5	...	...	...	...	...	
	LNE	21 7	...	...	...	...	...	Algeria.
	MNZ	18	18	...	...	...	...	
	F	22 10	...	...	...	...	...	
31	eN	3 26 55	...	...	...	...	...	
	eL	36	...	...	...	...	...	
	F	4 0	...	...	...	...	...	
31	eLNE	6 20	...	...	...	...	...	
	MN	38	22	...	...	...	...	
	F	7 10	...	...	...	...	...	
31	ePZ	20 30 (5)	...	...	...	...	(9370)	
	eSNE	40 34	...	...	...	...	...	
	LNE	58	...	...	...	...	...	
	ME	21 7	22	...	...	...	...	
	F	40	...	...	...	...	...	
April								
2	e	4 8	...	...	...	...	...	
	F	15	...	...	...	...	...	
2/4	—	— — —	...	...	...	...	...	$2^d\ 10^h$ to $4^d\ 12^h$. No Z record.
5	eL	9 25	...	...	...	...	...	
	F	30	...	...	...	...	...	
5/6	eE	23 47 57	...	...	...	...	...	
	L	51	...	...	...	...	...	
	F	0 5	...	...	...	...	...	
7	ePEZ	19 44 31	...	...	...	...	8950	Pacific Ocean.
	eSE	54 39	...	...	...	...	...	13·7° N, 92·7° W.
	L	20 12	...	...	...	...	...	(J.S.A.).
	M	17	20	...	...	...	...	
	F	50	...	...	...	...	...	
8	ePZ	10 30 1	...	...	...	...	...	Lanao, Mindanao.
	eZ	34 32	...	...	...	...	...	(Manila).
	e	43 33	...	...	...	...	...	
	L	11 (17)	...	...	...	...	...	
	F	45	...	...	...	...	...	
9	ePZ	4 6 34	...	...	...	...	...	
	eZ	10 41	...	...	...	...	...	
	L	47	...	...	...	...	...	
	F	5 20	...	...	...	...	...	
10	eE	5 47 13	...	...	...	...	...	Felt near Bologna,
	L	49 7	...	...	...	...	...	Italy.
	MZ	50 43	11	...	...	+10	...	
	F	57	...	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
April		h. m. s.	s.	μ	μ	μ	km.	
10	ez	16 37	...	...	...	...	...	N-S and E-W records disturbed by wind.
cont.	F	45	...	...	...	...	...	
11	ez	1 2	...	...	...	...	...	
	F	6	...	...	...	...	...	
11	ez	1 45	...	...	...	...	...	
	F	55	...	...	...	...	...	
12	ez	0 38	...	...	...	...	...	
	F	45	...	...	...	...	...	
12	ez	5 28	...	...	...	...	...	
	F	31	...	...	...	...	...	
13	eL	7 35	...	...	...	...	...	
	F	55	...	...	...	...	...	
13	e	21 31	...	...	...	...	...	Felt near Bologna.
	eL$_E$	51	...	...	...	...	...	
	eL$_{NZ}$	22 2	...	...	...	...	...	
	F	30	...	...	...	...	...	
16	eL$_E$	1 35	...	...	...	...	...	
	F	2 0	...	...	...	...	...	
16	eL	15 0	...	...	...	...	...	
	F	20	...	...	...	...	...	
17	eL	3 28	...	...	...	...	...	
	F	40	...	...	...	...	...	
17	eL	19 27	...	...	...	...	...	
	F	35	...	...	...	...	...	
19	e	4 19·4	...	...	...	...	...	Felt near Bologna.
	e$_N$	21 16	...	...	...	...	...	
	ez	21 46	...	...	...	...	...	
	e$_E$	22 6	...	...	...	...	...	
	M$_{EZ}$	22 56	12	...	...	...	...	
	F	30	...	...	...	...	...	
20	e	1 12·6	...	...	...	...		A repetition of preceding shock.
	iz	15 33	...	...	...	...	...	
	i$_E$	15 41	...	...	...	...	...	
	M$_{EZ}$	17 15	12	...	−17	+18	...	
	F	25	...	...	...	...	...	
21	e	12 52	...	...	...	...	...	
	F	13 15	...	...	...	...	...	
22	e	8 30·7	...	...	...	...	...	Felt in Italy.
	M	33·0	...	...	...	...	...	
	F	35	...	...	...	...	...	
23	eL$_{NE}$	1 6	...	...	...	...	...	
	F	15	...	...	...	...	...	
27	eL	12 22	...	...	...	...	...	
	F	50	...	...	...	...	...	
27	eL	22 0	...	...	...	...	...	
	F	40	...	...	...	...	...	
28	ez	5 16	...	...	...	...	...	
	F	17	...	...	...	...	...	
28	e	19 45	...	...	...	...	...	Felt in Italy.
	F	49	...	...	...	...	...	
29	e	18 40	...	...	...	...	...	
	M	43	11	...	...	...	...	
	F	48	...	...	...	...	...	
30	eL	19 41	...	...	...	...	...	
	F	51	...	...	...	...	...	
May 1	ez	7 57	...	...	...	...	...	
	eL	8 38	...	...	...	...	...	
	F	9 15	...	...	...	...	...	
1	iP	15 45 28	...	...	...	...	4610	Dilatation.
May 1	PR$_{1EZ}$	15 47 9	...	...	...	...	...	Amplitudes of iP as read in mm.— N. E. Z. +0·1 +2·0 −4·6 Azimuth = 87° ± 3°, giving epicentre near 38° N, 56° E. Destructive near the Persian-Turkestan frontier.
cont.	iS	51 49	...	...	...	...	...	
	SR$_{1NZ}$	54 51	...	...	...	...	...	
	L$_N$	59·9	32	...	...	...	...	
	L$_E$	16 1 41	(25)	...	...	...	...	
	M$_1$	1 54	24	−240	...	...	...	
	L$_Z$	2·3	...	...	...	...	...	
	M$_2$	5 22	19	+210	...	...	...	
	M$_3$	6 36	17	...	−210	...	...	
	M$_4$	7 1	16	(−330)	...	...	...	
	M$_5$	8 48	17	+195	...	...	...	
	M$_6$	9 46	15	...	...	−165	...	
	M$_7$	11 40	13	...	+185	...	...	
	M$_8$	11 44	12	...	...	−185	...	
	L$_2$	18 20	...	...	...	...	...	Long waves via the Antipodes.
	F	19 45	...	...	...	...	...	
1	e	21 18	...	...	...	...	...	
	F	21	...	...	...	...	...	
1	eL	22 46	...	...	...	...	...	
	F	23 25	...	...	...	...	...	
2	iPz	14 38 12	...	...	...	...	...	N-S and E-W records disturbed by wind.
	L	15 12	...	...	...	...	...	
	F	50	...	...	...	...	...	
3	eL	16 46	...	...	...	...	...	
	F	17 0	...	...	...	...	...	
6	ez	5 28	...	...	...	...	...	N-S and E-W records disturbed by wind.
	L	6 12	...	...	...	...	...	
	F	40	...	...	...	...	...	Epicentre approx. 5° S, 135° E. (Manila).
7	ez	16 55·6	...	...	...	...	...	
	ez	17 5 19	...	...	...	...	...	
	L$_E$	32	35	...	...	...	...	
	Lz	39·1	...	...	...	...	...	
	M$_1$	49 26	20	...	+18	...	...	
	M$_2$	50 37	20	...	...	+43	...	
	M$_3$	50 43	20	+32	...	...	...	
	F	?	...	...	...	...	...	F overlapped by the following disturbance.
7	eL	18 40	...	...	...	...	...	
	F	19 15	...	...	...	...	...	
10	eL	11 56	...	...	...	...	...	
	F	12 3	...	...	...	...	...	
11	eP	19 25·7	...	...	...	...	(1100)	Near Bologna, 44° 28′ N., 11° 71′ E (Strasbourg).
	eS$_E$	27 41	...	...	...	...	...	
	iz	28 25	...	...	...	...	...	
	i(L)$_E$	28 33	...	...	...	...	...	
	M$_1$	29 39	16	+13	...	...	...	
	M$_2$	29 56	11	...	−18	...	...	
	M$_3$	29 58	12	...	...	+21	...	
	F	35	...	...	...	...	...	
12	eL	10 17	...	...	...	...	...	
	F	45	...	...	...	...	...	
12	eL	17 11	...	...	...	...	...	
	F	20	...	...	...	...	...	
13	ez	13 44 35	...	...	...	...	...	N-S record disturbed by wind.
	e(L)$_E$	52	...	...	...	...	...	
	F	14 25	...	...	...	...	...	
18	Pz	1 11 26	...	...	...	...	...	
	L$_{NE}$	30	...	...	...	...	...	
	F	2 0	...	...	...	...	...	
18	P$_{EZ}$	6 43 48	...	...	...	...	3120	Compression.
	iS$_N$	48 40	...	...	...	...	...	Destructive near Siwas (Asia Minor).
	L$_N$	50 16	45	...	...	...	...	
	M$_1$	52 12	39	+110	...	...	...	40·5° N, 37° E (Strasbourg).
	Lz	53	...	...	...	...	...	
	M$_2$	54 29	24	−54	...	...	...	
	M$_3$	56 3	22	...	+53	...	...	
	M$_4$	58 46	17	...	...	−29	...	
	F	8 0	...	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
May		h. m. s.	s.	μ	μ	μ	km.	
20	P_Z	5 4 49	...	...	...	...	8570	Near Aleutian Islands. 53° N, 178° W (U.S.C. and G.S.).
	eS_{NE}	14 38	...	...	...	...	...	
	e_N	15 34	...	...	...	...	...	
	SR_{1N}	20 14	...	...	...	...	...	
	L	32	...	...	...	...	...	
	M_E	47	18	...	...	...	...	
	F	7 45	...	...	...	...	...	
21	eP_Z	16 48 16	...	...	...	...	9210	Hiuga Sea off Mijazaki (Kobe).
	eS_{NE}	58 37	...	...	...	...	...	
	SR_{1NE}	17 5·7	...	...	...	...	...	
	L_{NE}	18	40	...	...	...	...	
	L_Z	23	30	...	...	...	...	
	M_1	23 36	26	...	−80	...	...	
	M_2	24 42	26	−62	...	...	...	
	M_3	33 37	18	...	...	+42	...	
	F	19 30	...	...	...	...	...	
22	eL_{EZ}	21 26	...	...	...	...	...	No N-S record.
	F	22 20	...	...	...	...	...	
24	eL	19 16	...	...	...	...	...	
	F	30	...	...	...	...	...	
25	iP_Z	12 12 11	...	...	...	...	(9010)	Northern Peru.
	$i(S)_E$	22 22	...	...	...	...	...	May be ScPcS.
	$i(S)_{NE}$	22 32	...	...	...	...	...	
	L	36	...	...	...	...	...	
	F	13 10	...	...	...	...	...	
26	—	— — —	...	...	...	...	...	1ʰ to 5ʰ 30ᵐ. No records.
26	eL	9 43	...	...	...	...	...	
	F	10 15	...	...	...	...	...	
26/27	eP_Z	22 51 19	...	...	...	...	7710	Pacific Ocean, near Alaska.
	eS_{NE}	23 0 25	...	...	...	...	...	
	L_{NE}	8·5	50	...	...	...	...	54·5° N, 137° W (U.S.C. and G.S.).
	M_1	11 6	(50)	...	(−490)	...	...	
	L_Z	23 13 3	(39)	...	...	...	...	
	M	13 15	(39)	(+350)	...	...	...	
	M_2	20 10	16	...	+185	...	...	
	M_3	21 18	18	−300	...	...	...	
	M_4	21 22	18	...	...	+260	...	
	M_5	23 53	16	−260	...	...	...	
	M_6	23 56	16	...	...	+250	...	
	M_7	26 13	16	...	(−220)	...	...	
	M_8	1 18	20	7	...	...	...	Via the Antipodes.
	F	3 20	...	...	...	...	...	
27	eL	5 46	...	...	...	...	...	
	F	6 15	...	...	...	...	...	
28	ez	0 8 24	...	...	...	...	...	
	L	38	...	...	...	...	...	
	F	1 35	...	...	...	...	...	
28	eL	5 52	...	...	...	...	...	
	F	6 10	...	...	...	...	...	
28	ez	7 20	...	...	...	...	...	N-S and E-W records disturbed by wind.
	F	22	...	...	...	...	...	
30	eP_Z	9 57 31	...	...	...	...	(11500)	Destructive in province of Mendoza, Argentine.
	PR_{1Z}	10 1 47	...	...	...	...	...	
	L_{NE}	29	...	...	...	...	...	
	L_Z	36	...	...	...	...	...	
	M_1	41 34	20	+20	...	...	...	54·5° N, 137° W. (U.S.C. and G.S.).
	M_2	41 47	20	...	...	+31	...	
	M_3	42 2	20	...	+20	...	...	N-S and E-W records disturbed by wind.
	F	13 0	...	...	...	...	...	
30	L_Z	13 3	...	...	...	...	...	
	F	55	...	...	...	...	...	
30/31	—	— — —	...	...	...	...	...	19ʰ to 11ʰ. No records.
June								
1	eP_Z	18 11 38	...	...	...	...	(9770)	S.E. of Okinawa Islands. (Kobe).
	eS_{EN}	22 (26)	...	...	...	...	...	
	L_{NE}	41	...	...	...	...	...	
	F	19 25	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
June		h. m. s.	s.	μ	μ	μ	km.	
2	$e(P)_Z$	21 50 44	...	...	...	...	(8900)	Japan. 40° N, 140° E, (J.S.A.).
	i_Z	52 4	...	...	...	...	...	
	iS	22 0 49	...	...	...	...	...	
	L	?	...	...	...	...	...	
	M_E	29	20	...	6	...	...	Probably more than one shock.
	F	23 10	...	...	...	...	...	
3	P_Z	20 38 6	...	...	...	...	5080	Turkestan, near Tashkent.
	eS_{NE}	44 53	...	...	...	...	...	
	SR_{1NE}	48 1	...	...	...	...	...	
	L_N	52·4	36	...	...	...	...	
	L_{EZ}	54·7	26	...	...	...	...	N-S and E-W records disturbed by wind.
	M_N	56 39	16	−48	...	...	...	
	F	21 30	...	...	...	...	...	
4	ez	7 24	...	...	...	...	...	
	F	45	...	...	...	...	...	
4	ez	15 33·8	...	...	...	...	...	
	e_E	39 28	...	...	...	...	...	
	L	16 (0)	...	...	...	...	...	
	F	55	...	...	...	...	...	
5	e	9 30	...	...	...	...	...	
	F	45	...	...	...	...	...	
6	eP_Z	10 59 41	...	...	...	...	5940	Atlantic Ocean, near St. Paul's Rock. (Strasbourg).
	iS_N	11 7 14	...	...	...	...	...	
	L_{NE}	14	...	...	...	...	...	
	L_Z	16·5	...	...	...	...	...	
	M_{NE}	22	...	...	...	...	...	
	F	12 30	...	...	...	...	...	
6	e	14 45	...	...	...	...	...	
	F	15 40	...	...	...	...	...	
6	eL	16 45	...	...	...	...	...	
	F	17 15	...	...	...	...	...	
6	ez	17 37	...	...	...	...	...	
	F	18 40	...	...	...	...	...	
9	iP_Z	9 20 5	...	...	...	...	8830	Compression.
	S_{NE}	30 7	...	...	...	...	...	Kurile Isles.
	SR_{1NE}	35·8	...	...	...	...	...	47·1° N, 153·7° E, (J.S.A.).
	L_E	44	50	...	...	...	...	
	M_1	51 40	26	...	−33	...	...	
	M_2	57 48	19	+27	...	...	...	
	M_3	10 4 38	14	...	...	+18	...	
	F	12 30	...	...	...	...	...	
10	eL	0 2	...	...	...	...	...	
	F	30	...	...	...	...	...	
10	eL	1 0	...	...	...	...	...	
	F	10	...	...	...	...	...	
10/11	iP	23 7 51	...	...	...	...	2210	Dilatation.
	iS	11 32	...	...	...	...	...	Amplitudes of iP as read in mm.—
	L	13·0	(35)	...	...	...	...	N. E. Z.
	M_1	15 41	17	...	+13	...	...	+2·85 +0·4 −3·0
	M_2	16 40	15	−15	...	...	...	Azimuth = 9° ± 1°, giving epicentre near 71° N, 9° E.
	M_3	19 17	12	...	...	+14	...	
	F	0 35	...	...	...	...	...	Arctic Ocean, between Norway and Jan Mayen.
12	ez	12 1 55	...	...	...	...	...	
	ez	3 41	...	...	...	...	...	Pacific Ocean.
	ez	6 21	...	...	...	...	...	2° N, 162° E. (Manila).
	e_{NE}	14 18	...	...	...	...	...	
	L	(44)	...	...	...	...	...	
	M	13 (0)	19	...	...	...	...	
	F	14 10	...	...	...	...	...	
13	iP	0 24 26	...	...	...	...	8830	Compression.
	iz	26 25	...	...	...	...	...	Kurile Isles.
	S_N	34 28	...	...	...	...	...	47·1° N, 153·7° E, (J.S.A.).
	eSR_{1N}	40 16	...	...	...	...	...	
	L	?	...	...	...	...	...	Repetition of June 9ᵈ.
	M_1	1 1 33	20	...	−39	...	...	
	M_2	1 51	20	...	...	−33	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
June		h. m. s.	s.	μ	μ	μ	km.	
13	M_3	1 2 6	21	+50	...	...	...	Overlapped by following disturbance.
cont.	F	?	...	...	...	...	...	
13	iP	0 38 2	...	...	...	...	8890	Compression.
	iS$_{NE}$	48 7	...	...	...	...	...	Repetition of preceding shock.
	SR$_{1N}$	54	...	...	...	...	...	
	M_1	1 9 22	24	...	+59	...	...	
	M_2	17 4	17	−57	...	...	...	
	M_3	22 35	14	...	...	+45	...	
	F	4 5	...	...	...	...	...	
13	ePR$_{1Z}$	9 42·2	...	...	...	...	(11000)	P lost in changing charts.
	i$_{NE}$	49 58	...	...	...	...	...	
	i$_{NE}$	52 27	...	...	...	...	...	Philippine Islands.
	L$_{NE}$	10 11	...	...	...	...	...	14° N, 133·5° E, (Strasbourg).
	M_1	30 44	21	...	−69	...	...	
	M_2	31 13	19	(−90)	...	...	...	
	M_3	31 28	18	...	...	+97	...	
	F	13 0	...	...	...	...	...	
13	eL	13 58	...	...	...	...	...	
	F	14 0	...	...	...	...	...	
13	eL	20 43	...	...	...	...	...	
	F	21 35	...	...	...	...	...	
13/14	ez	23 19 12	...	...	...	...	...	Aftershock of 13^d 9^h.
	e$_{NE}$	25 31	...	...	...	...	...	
	L	56	...	...	...	...	...	
	M	0 8	19	...	...	...	...	
	F	1 40	...	...	...	...	...	
15	eL	0 19	...	...	...	...	...	
	F	40	...	...	...	...	...	
15	eL$_{EZ}$	10 2	...	...	...	...	...	N-S records disturbed by wind.
	F	15	...	...	...	...	...	
15	eL$_{EZ}$	20 37	...	...	...	...	...	
	F	21 15	...	...	...	...	...	
15	eL$_{EZ}$	22 7	...	...	...	...	...	
	F	30	...	...	...	...	...	
16/17	eP$^1_{NZ}$	23 7 38	...	...	...	...	19000	Compression.
	i$_{NZ}$	8 56	...	...	...	...	...	Destructive in New Zealand.
	iPR$_{1Z}$	12 38	...	...	...	...	...	
	iPR$_{1N}$	12 44	...	...	...	...	...	41·9° S, 172·5° E, (Wellington).
	PR$_{2Z}$	16 46	...	...	...	...	...	
	i$_Z$	23 8	...	...	...	...	...	
	iPS$_N$	26 36	...	...	...	...	...	E record defective.
	SR$_{1N}$	34 4	...	...	...	...	...	
	e$_N$	39·5	...	...	...	...	...	
	iSR$_{2N}$	41 36	...	...	...	...	...	
	e$_N$	23 45·5	...	...	...	...	...	
	e$_N$	53·6	...	...	...	...	...	
	L$_N$	0 (5)	...	...	...	...	...	
	M_1	17 15	27	...	+210	...	...	
	M_2	31 38	19	+135	...	...	...	
	M_3	36 24	18	+155	...	...	...	
	M_4	39 16	18	...	...	+145	...	
	F	4 40	...	...	...	...	...	
17	ez	10 34·9	...	...	...	...	...	
	L$_N$	11 12	...	...	...	...	...	
	M	24	18	...	...	...	...	
	F	12 25	...	...	...	...	...	
19	ePz	7 44 55	...	...	...	...	(12500)	
	ePR$_{1Z}$	49 19	...	...	...	...	...	
	eScPcS$_{NE}$	55 35	...	...	...	...	...	
	e$_{NE}$	56 47	...	...	...	...	...	
	L	8 22	...	...	...	...	...	
	M$_{NE}$	38	19	...	...	...	...	
	F	10 10	...	...	...	...	...	
20	eL	19 30	...	...	...	...	...	
	F	45	...	...	...	...	...	
20	eL	21 10	...	...	...	...	...	
	F	35	...	...	...	...	...	
21	eL	5 45	...	...	...	...	...	
	F	6 15	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
June		h. m. s.	s.	μ	μ	μ	km.	
22	eP^1_Z	15 50 14	...	...	...	...	(19000)	Felt in New Zealand.
	ez	51 28	...	...	...	...	...	Repetition of June 16^d.
	ePR$_{1Z}$	55 19	...	...	...	...	...	
	ePR$_{2Z}$	59 22	...	...	...	...	...	
	L$_{NE}$	16 48	...	...	...	...	...	
	L$_Z$	58	...	...	...	...	...	
	M$_E$	17 6	21	...	...	...	...	
	M$_Z$	11	19	...	...	...	...	
	F	18 5	...	...	...	...	...	
22	eP^1_Z	18 59 11	...	...	...	...	...	Felt in New Zealand.
	ez	19 0 25	...	...	...	...	...	Further repetition.
	ePR$_{1Z}$	4 17	...	...	...	...	...	
	ez	5 59	...	...	...	...	...	
	L$_E$	20 8	...	...	...	...	...	
	L$_Z$	11	...	...	...	...	...	
	F	21 0	...	...	...	...	...	
23	eL	4 18	...	...	...	...	...	
	F	30	...	...	...	...	...	
23	eL$_{NE}$	22 43	...	...	...	...	...	No Z record. 23^d 12^h 25^m to 24^d 9^h 30^m.
	F	23 20	...	...	...	...	...	
24	eL	2 56	...	...	...	...	...	
	F	3 3	...	...	...	...	...	
25	eL$_Z$	10 17	...	...	...	...	...	N-S and E-W records disturbed by wind.
	F	45	...	...	...	...	...	
26	ez	6 41·3	...	...	...	...	...	
	L	7 6	...	...	...	...	...	
	F	8 0	...	...	...	...	...	
26	ez	17 1·9	...	...	...	...	...	Off Cape Inubo, Japan.
	L	38	...	...	...	...	...	(Manila).
	F	18 20	...	...	...	...	...	
27	ePz	13 1 37	...	...	...	...	(12000)	Compression.
	ePR$_{1Z}$	6·1	...	...	...	...	...	No N record.
	iPR$_{2Z}$	8 50	...	...	...	...	...	Atlantic Ocean, north of Sandwich Islands.
	eScPcS$_E$	12 42	...	...	...	...	...	58·5° S, 40° W.
	e(S)$_E$	13 57	...	...	...	...	...	(Strasbourg).
	iPS	15 34	...	...	...	...	...	
	ePPS$_E$	16·3	...	...	...	...	...	
	ez	16·9	...	...	...	...	...	
	iSR$_{1E}$	21 58	...	...	...	...	...	Well marked phases.
	iSR$_{2E}$	25 37	...	...	...	...	...	
	iSR$_{3E}$	28 43	...	...	...	...	...	
	iL$_E$	32 16	50	...	...	...	...	
	M$_1$	34 20	34	...	−330	...	...	
	M$_2$	38 2	29	...	+250	...	...	
	iL$_Z$	38 16	38	...	...	...	...	
	M$_3$	48 14	19	...	...	−250	...	
	M$_4$	50 48	18	...	−120	...	...	
	M$_5$	53 55	16	...	...	+165	...	
	M$_6$	59 46	17	...	...	+160	...	
	F	19 0	...	...	...	...	...	
27	Pz	22 43 36	...	...	...	...	...	
	eS$_{NE}$	47 22	...	...	...	...	2270	
	L	49	...	...	...	...	...	
	M	50·1	15	...	...	...	...	
	F	23 30	...	...	...	...	...	
28	Pz	1 32 27	...	...	...	...	...	
	L	40	...	...	...	...	...	
	F	2 0	...	...	...	...	...	
28	eL	2 32	...	...	...	...	...	
	F	45	...	...	...	...	...	
30	eP^1_Z	2 59·0	...	...	...	...	(19000)	
	ez	3 3 23	...	...	...	...	...	
	e$_E$	9·6	...	...	...	...	...	
	e$_N$	10·8	...	...	...	...	...	
	(SR$_2$)$_N$	35 35	...	...	...	...	...	
	L$_{NE}$	40	...	...	...	...	...	
	M	52	18	...	...	...	...	
	F	5 40	...	...	...	...	...	
30	eL	6 19	...	...	...	...	...	
	F	45	...	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
July		h. m. s.	s.	μ	μ	μ	km.	
1	—	— — —	...	...	...	...	...	17h 13m to 18h 28m. No records.
2	eL	1 35	...	...	...	...	...	
	F	2 0	...	...	...	...	...	
2	eL	2 53	...	...	...	...	...	
	F	3 10	...	...	...	...	...	
2	eL	16 8	...	...	...	...	...	
	F	50	...	...	...	...	...	
2	iN	20 27 32	...	...	...	...	...	Felt in Gloucestershire.
	eE	27 35	...	...	...	...	...	
	F	28	...	...	...	...	...	
3	ePz	1 3 33	...	...	...	...	7130	Probably in Alaska. (J.S.A.).
	eSNE	12 9	...	...	...	...	...	
	eE	13 14	...	...	...	...	...	
	L	24	...	...	...	...	...	
	F	50	...	...	...	...	...	
3	e	8 33·7	...	...	...	...	...	
	L	36	...	...	...	...	...	
	F	40	...	...	...	...	...	
3	eL	19 0	...	...	...	...	...	
	F	20 0	...	...	...	...	...	
4	PNZ	4 38 57	...	...	...	...	6940	Central Alaska.
	SN	47 23	...	...	...	...	...	64° N, 149° W, (J.S.A.).
	SR_1	51·4	...	...	...	...	...	
	L	59	32	...	...	...	...	Cf. July 3d 1h.
	F	6 0	...	...	...	...	...	
4	ePz	7 19 15	...	...	...	...	2460	
	eSNE	23 17	...	...	...	...	...	
	L	24·4	...	...	...	...	...	
	M	25·6	20	...	...	...	...	
	F	?	...	...	...	...	...	Overlapped by next shock.
4	eL	7 41·5	...	...	...	...	...	Probably a repetition of preceding shock.
	F	55	...	...	...	...	...	
4	ePz	8 1 29	...	...	...	...	(2400)	Probably a further repetition.
	S	5·4	...	...	...	...	...	
	L	7	...	...	...	...	...	
	F	25	...	...	...	...	...	
4	ez	9 49	...	...	...	...	...	
	F	10 1	...	...	...	...	...	
4	eLz	12 44	...	...	...	...	...	
	F	50	...	...	...	...	...	
5	Pz	14 30 59	...	...	...	...	8750	Compression.
	SE	40 57	...	...	...	...	...	Aleutian Islands, 50° N, 177° W (J.S.A.).
	PSz	41 43	...	...	...	...	...	
	LE	52	...	...	...	...	...	
	M_1	15 8 37	22	...	−77	...	...	N-S record disturbed by wind.
	M_2	12 1	18	...	...	−73	...	
	F	19 0	...	...	...	...	...	
5/6	Pz	22 48 17	...	...	...	...	8710	Dilatation.
	SNE	58 13	...	...	...	...	...	
	L	23 19	...	...	...	...	...	Repetition of preceding shock.
	M	33	18	...	...	...	...	
	F	1 50	...	...	...	...	...	
6	Pz	2 15 47	...	...	...	...	...	Compression.
	SNE	25·9	...	...	...	...	...	Further repetition.
	SR_1N	31 28	...	...	...	...	...	
	L	40	...	...	...	...	...	
	MN	49	24	...	...	...	...	
	F	4 40	...	...	...	...	...	
6	iPEZ	9 55 28	...	...	...	...	5810	Dilatation.
	iSNE	10 2 54	...	...	...	...	...	Atlantic Ocean, 15·6° N, 43·4° W. (J.S.A.).
	LE	8 23	...	...	...	...	...	
	LN	8 29	...	...	...	...	...	
	M	8 27	27	+34	−28	...	...	
	F	11 45	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
July 7/8	iP	21 35 7	...	...	...	...	8610	Compression. Aleutian Islands. 50° N, 177° W, (J.S.A.) (cf. July 5d and 6d).
	iPcPz	35 35	...	...	...	...	...	
	iSN	44 58	...	...	...	...	...	
	iPSNZ	45 33	...	...	...	...	...	
	SR_1NZ	50·5	...	...	...	...	...	
	SR_2N	53 56	...	...	...	...	...	
	LE	56·1	...	...	...	...	...	
	LNZ	22 0·5	...	...	...	...	...	
	M_1	5 45	28	...	+145	...	...	
	M_2	10 20	22	−155	...	...	...	
	M_3	11 22	22	...	+125	...	...	
	M_4	16 51	19	...	...	+145	...	
	M_5	21 36	18	...	...	+135	...	
	L_2	23 42	...	...	...	...	...	Via the Antipodes.
	M_6	58	...	...	...	...	...	
	F	3 10	...	...	...	...	...	
8	eLNE	19 51	...	...	...	...	...	No Z records.
	F	20 20	...	...	...	...	...	
11	eLNE	21 24	...	...	...	...	...	
	F	19 10	...	...	...	...	...	
12	eLNE	18 47	...	...	...	...	...	
	F	19 10	...	...	...	...	...	
13	eNE	7 51	...	...	...	...	...	
	L	8 4	...	...	...	...	...	
	F	35	...	...	...	...	...	
13	e	12 58	...	...	...	...	...	
	F	13 5	...	...	...	...	...	
13	ez	15 11·5	...	...	...	...	...	
	L	52	...	...	...	...	...	
	F	17 5	...	...	...	...	...	
14	e	9 17	...	...	...	...	...	
	F	?	...	...	...	...	...	Overlapped by next shock.
14	PNZ	9 48 47	...	...	...	...	8550	Indian Ocean. 1° N, 77·5° E. (Strasbourg).
	ez	55·0	...	...	...	...	...	
	SNE	58 35	...	...	...	...	...	
	PSz	59 43	...	...	...	...	...	
	LNE	10 10	...	...	...	...	...	
	ME	23 3	19	...	−20	...	...	
	F	12 30	...	...	...	...	...	
15	PEZ	7 51 55	...	...	...	...	4380	Compression.
	PR_1Z	53 31	...	...	...	...	...	Felt in Khorassan.
	iSNE	58 4	...	...	...	...	...	Epicentre — 33° N, 46° E. (Strasbourg).
	eSR_1N	8 1 10	...	...	...	...	...	
	L	4	...	...	...	...	...	
	M	10	...	...	...	...	...	
	F	10 5	...	...	...	...	...	
15	eL	10 25	...	...	...	...	...	
	F	11 25	...	...	...	...	...	
16	ez	1 10 43	...	...	...	...	...	N-S and E-W records disturbed by wind.
	L	2 10	...	...	...	...	...	
	F	55	...	...	...	...	...	
17	iPz	8 50 2	...	...	...	...	(8900)	Aleutian Islands. 50° N, 177° W. (J.S.A.).
	S	9 0·1	...	...	...	...	...	
	L	15	...	...	...	...	...	
	ME	25	25	...	...	...	...	
	F	11 30	...	...	...	...	...	
17	eL	21 20	...	...	...	...	...	
	F	22 5	...	...	...	...	...	
18	eL	7 30	...	...	...	...	...	
	F	8 0	...	...	...	...	...	
18	e	21 7·8	...	...	...	...	...	
	F	15	...	...	...	...	...	
21	ez	6 16 21	...	...	...	...	...	
	F	20	...	...	...	...	...	
21	eL	11 25	...	...	...	...	...	
	F	40	...	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). 1929.

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
July		h. m. s.	s.	μ	μ	μ	km.	
21	eL	14 12	...	...	...	...	...	
	F	40	...	...	...	...	...	
23	ePz	18 47 2	...	...	...	...	1940	Compression. Felt at Reykjavik, Iceland.
	ePNE	47 6	...	...	...	...		
	eSz	50 20	...	...	...	...		
	eSE	50 28	...	...	...	...	...	Epicentre — 64° N, 23° W. (Strasbourg).
	eSN	50 32	...	...	...	...	...	
	LNE	51 2	36	...	...	...	...	
	Lz	51 16	...	...	...	...	...	
	M_1	52 36	17	−81	...	...	...	
	M_2	53 30	13	...	+73	...	...	
	M_3	53 8 to 57	15	...	...	±83	...	
	M_4	54 19	13	+74	...	...	...	
	M_5	54 53	11	...	...	+72	...	
	F	?	...	...	...	...	...	Overlapped by next shock.
23	eL	20 12·4	...	...	...	...	...	
	F	50	...	...	...	...	...	
24	eLz	23 10	...	...	...	...	...	
	F	18	...	...	...	...	...	
25	e	0 34·8	...	...	...	...	...	
	L	42	...	...	...	...	...	
	F	1 15	...	...	...	...	...	
25	eLz	12 9	...	...	...	...	...	
	F	20	...	...	...	...	...	
25	ePz	23 8·1	...	...	...	...	...	
	eSN	17·1	...	...	...	...	...	
	L	29	...	...	...	...	...	
	F	0 0	...	...	...	...	...	
26	e	17 53	...	...	...	...	...	
	F	18 5	...	...	...	...	...	
26/27	ePz	23 0 56	...	...	...	...	9210	Felt in Japan.
	eSNE	11 17	...	...	...	...	...	
	LNE	31	...	...	...	...	...	
	Lz	37	...	...	...	...	...	
	F	0 30	...	...	...	...	...	
27	ez	13 10·1	...	...	...	...	...	
	L	18	...	...	...	...	...	
	F	45	...	...	...	...	...	
Aug. 1	iz	5 13 20	...	...	...	...	...	Indian Ocean, west of Andaman Islands. (Strasbourg).
	iz	13 21	...	...	...	...	...	
	eSNE	24 36	...	...	...	...	...	
	MN	52·2	...	...	...	...	...	
	F	6 30	...	...	...	...	...	
1	eLz	9 36	...	...	...	...	...	N-S and E-W records disturbed by wind.
	F	10 0	...	...	...	...	...	
1	eL	18 51	...	...	...	...	...	
	F	54	...	...	...	...	...	
3	ez	13 9 9	...	...	...	...	...	N-S and E-W records disturbed by wind.
	Lz	14 4	...	...	...	...	...	
	F	15 0	...	...	...	...	...	
3	ez	15 18 9	...	...	...	...	...	
	Lz	16 10	...	...	...	...	...	
	F	17 0	...	...	...	...	...	
3	eLEz	19 28	...	...	...	...	...	
	F	20 10	...	...	...	...	...	
3	e	9 15	...	...	...	...	...	
	F	25	...	...	...	...	...	
4/5	eL	23 1	...	...	...	...	...	
	F	0 15	...	...	...	...	...	
5	—	— — —	...	...	...	...	...	9h 5m to 10h 18m. No records.
5	eL	15 17	...	...	...	...	...	
	F	35	...	...	...	...	...	
6	e(P)z	1 34 52	...	...	...	...	...	
	e(S)E	38 40	...	...	...	...	(2290)	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Aug. 6	L	h. m. s. 1 41	s. ...	μ ...	μ ...	μ ...	km. ...	
cont.	F	2 10	...	...	...	...	...	
8	ePz	13 9 18	...	...	...	...	8710	Compression. Destructive in Burma, 22° N, 95° E. (Strasbourg).
	iPz	9 22	...	...	...	...	...	
	eSNE	19 14	...	...	...	...	...	
	LNE	37	...	...	...	...	...	
	Lz	40	...	...	...	...	...	
	M_1	42 56	24	−77	...	...	...	
	M_2	48 59	19	...	−31	...	...	
	M_3	49 3	18	...	...	+23	...	
	F	15 30	...	...	...	...	...	
11	eLz	18 35	...	...	...	...	...	
	F	20	...	...	...	...	...	
14	e(P)	2 37 31						
	L	3 40						
	F	4 35	...	...	...	...	...	
14	ez	6 45	...	...	...	...	...	
	F	7 0	...	...	...	...	...	
15	iPZE	20 8 42	...	...	...	...	8930	Dilatation.
	eSNE	18 49	...	...	...	...	...	
	LN	30	...	...	...	...	...	Pacific Ocean, near Central America.
	LZE	34·8	...	...	...	...	...	
	F	21 30	...	...	...	...	...	4·5° N, 81·5° W. (U.S.C. and G.S.).
16	eL	22 29	...	...	...	...	...	
	F	23 10	...	...	...	...	...	
16	eL	23 35	...	...	...	...	...	
	F	0 0	...	...	...	...	...	
17	e	4 27	...	...	...	...	...	
	F	30	...	...	...	...	...	
17	—	— — —	...	...	...	...	...	8h 40m to 9h 39m. No records.
17/18	iPZE	23 53 11	...	...	...	...	9310	Compression.
	PR1Z	56·4	...	...	...	...	...	Accapulco Deep, Mexico.
	iSE	0 3 37	...	...	...	...	...	
	L	23	...	...	...	...	...	14·3° N, 98·2° W. (J.S.A.).
	F	1 45	...	...	...	...	...	
18	L	9 48·5	...	...	...	...	...	
	F	10 53	...	...	...	...	...	
19	iPz	2 56 1	...	...	...	...	9310	Compression.
	PR1Z	59 32	...	...	...	...	...	
	eSNE	3 6 27	...	...	...	...	...	
	LNE	25	...	...	...	...	...	
	Lz	32	...	...	...	...	...	
	M_1	38 59	21	+54	...	...	...	
	M_2	39 54	17	...	−35	...	...	
	M_3	41 12	16	...	...	−45	...	
	F	5 25	...	...	...	...	...	
19	eNE	21 7 54	...	...	...	...	...	
	LNE	27	...	...	...	...	...	
	Lz	36	...	...	...	...	...	
	F	22 15	...	...	...	...	...	
20	ePz	16 51 15	...	...	...	...	9310	Compression.
	PR1Z	54·8	...	...	...	...	...	
	eSNE	17 1 41	...	...	...	...	...	Probably repetition of Aug. 17d 23h.
	LNE	22	...	...	...	...	...	
	Lz	27	...	...	...	...	...	
	F	18 50	...	...	...	...	...	
21	eL	10 25·6	...	...	...	...	...	
	F	42	...	...	...	...	...	
22	ez	7 54·6	...	...	...	...	...	
	L	9 3	...	...	...	...	...	
	F	30	...	...	...	...	...	
22	Lz	17 36	...	...	...	...	...	
	F	45	...	...	...	...	...	
26/27	—	— — —	...	...	...	...	...	19h 45m to 9h 25m. No Z record.

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Aug.		h. m. s.	s.	μ	μ	μ	km.	
28	ePz	19 4 4	...	...	...	...	9300	Compression.
	PR_{1Z}	7 21	...	...	...	...	...	
	eSE	14 29	...	...	...	...	...	
	SR_{1E}	19 51	...	...	...	...	...	
	SR_{2E}	23 22	...	...	...	...	...	
	LE	32	...	...	...	...	...	
	LN	35	...	...	...	...	...	
	LZ	38	...	...	...	...	...	
	ME	40 5	21	...	+32	...	...	
	F	21 30	...	...	...	...	...	
29	eL	20 35	...	...	...	...	...	
	F	21 5	...	...	...	...	...	
31	eL	19 45	...	...	...	...	...	
	F	20 10	...	...	...	...	...	
Sept.								
1	eLZ	16 14	...	...	...	...	...	
	F	50	...	...	...	...	...	
1	L	17 22	...	...	...	...	...	
	F	18 20	...	...	...	...	...	
2	eZ	11 35	...	...	...	...	...	
	eE	37·5	...	...	...	...	...	
	eNE	38·6	...	...	...	...	...	
	LNE	12 8	...	...	...	...	...	
	LZ	16	...	...	...	...	...	
	F	13 40	...	...	...	...	...	
3	iPEZ	12 16 49	...	...	...	...	5700	Compression.
	PcPEZ	17 3	...	...	...	...	...	
	iS	24 9	...	...	...	...	...	Afganistan. (Strasbourg).
	(PS)NE	24 33	...	...	...	...	...	
	LNE	36	...	...	...	...	...	
	LZ	38	...	...	...	...	...	
	F	13 20	...	...	...	...	...	
4	e	22 43·3	...	...	...	...	...	
	LNE	51	...	...	...	...	...	
	LZ	53	...	...	...	...	...	
	F	23 30	...	...	...	...	...	
5	eLNE	14 33	...	...	...	...	...	
	eLZ	36	...	...	...	...	...	
	F	15 0	...	...	...	...	...	
8	LZ	18 8	...	...	...	...	...	
	F	20	...	...	...	...	...	Breaks in record from $9^d\ 13^h\ 30^m$ to $16^h\ 30^m$ and $10^d\ 8^h$ to 16^h during standardisation.
9/10	—	— — —	...	...	...	...	...	
10	eZ	20 36·5	...	...	...	...	...	
	eZ	40·6	...	...	...	...	...	
	eL	21 18	...	...	...	...	...	
	F	22 5	...	...	...	...	...	
11	eZ	22 42 5	...	...	...	...	...	
	LNE	23 6	...	...	...	...	...	Pacific Ocean off China.
	LZ	12	...	...	...	...	...	
	F	45	...	...	...	...	...	24° N, 124·5° E. (Manila).
14	eL	3 19	...	...	...	...	...	
	F	50	...	...	...	...	...	
15	eSE	13 21·2	...	...	...	...	...	
	e	21·6	...	...	...	...	...	Asia Minor. (Strasbourg).
	LNE	23	...	...	...	...	...	
	LZ	29	...	...	...	...	...	
	F	50	...	...	...	...	...	
17	eL	6 20	...	...	...	...	...	
	F	30	...	...	...	...	...	
17	PEZ	19 28 49	...	...	...	...	7780	Compression.
	eSN	37 58	...	...	...	...	...	North Pacific Ocean,
	LNE	47·5	...	...	...	...	...	off British Columbia.
	LZ	50	...	...	...	...	...	52° N, 133° W.
	M_1	57 45	18	...	+34	...	...	(U.S.C. and G.S.).
	M_2	20 1 30	16	+37	...	...	...	
	M_3	1 46	15	...	...	+40	...	
	L_2	21 41	...	...	...	...	...	
	F	23 30	...	...	...	...	...	

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Sept.		h. m. s.	s.	μ	μ	μ	km.	
26	—	— — —	...	...	...	...	...	2h 40m to 9h 8m. No records.
26	eL	16 24	...	...	...	...	...	
	F	35	...	...	...	...	...	
27/28	ePz	23 28 27	...	...	...	...	(9080)	Lower California.
	e(S)NE	38·7	...	...	...	...	...	24°N, 111°W. (U.S.C.
	LNE	53	...	...	...	...	...	and G.S.).
	LZ	57	...	...	...	...	...	
	F	1 10	...	...	...	...	...	
Oct.								
2/3	—	— — —	...	...	...	...	...	22h 21m to 9h 34m. No records.
5	eL	3 20	...	...	...	...	...	
	F	4 30	...	...	...	...	...	
5	iPZ	17 11 31	...	...	...	...	...	Compression.
	LE	33	...	...	...	...	...	Kamtchatka. 55° N,
	LZ	44	...	...	...	...	...	160° E. (J.S.A.).
	F	19 0	...	...	...	...	...	N-S and E-W records disturbed by wind.
6	(PR)	8 10 16	...	...	...	...	...	Hawai Islands, North
	(PS)	19·5	...	...	...	...	...	Pacific Ocean. 19·5°
	SR_1	25·4	...	...	...	...	...	N, 156° W. (J.S.A.).
	LNE	36	...	...	...	...	...	
	LZ	45	...	...	...	...	...	
	F	10 35	...	...	...	...	...	
6	eL	14 20	...	...	...	...	...	
	F	15 45	...	...	...	...	...	
7	eZ	15 27·6	...	...	...	...	...	
	L	16 24	...	...	...	...	...	
	F	17 30	...	...	...	...	...	
8	eZ	17 35 53	...	...	...	...	...	
	PR_1	39 49	...	...	...	...	...	
	LNE	18 32	...	...	...	...	...	
	LZ	38	...	...	...	...	...	
	F	19 45	...	...	...	...	...	
14	eEZ	10 21 37	...	...	...	...	...	9h 57m to 11h 27m.
	LEZ	46	...	...	...	...	...	No N-S record.
	F	12 0	...	...	...	...	...	
15	eL	19 9	...	...	...	...	...	
	F	30	...	...	...	...	...	
16	eL	1 14	...	...	...	...	...	
	F	30	...	...	...	...	...	
16/18	—	— — —	...	...	...	...	...	16d 9h 53m to 18d 10h 15m. No N-S record.
16	ePz	20 39 18	...	...	...	...	(8400)	Burma. 25·5° N, 97° E.
	eSE	48 58	...	...	...	...	...	(Manila).
	SR_{1E}	54·0	...	...	...	...	...	
	SR_{2E}	57·6	...	...	...	...	...	
	LE	21 6	...	...	...	...	...	
	LZ	10	...	...	...	...	...	
	F	22 10	...	...	...	...	...	
19	ePz	10 26 9	...	...	...	...	(10500)	Dilatation.
	iz	26 40	...	...	...	...	...	
	PR_{1Z}	29 56	...	...	...	...	...	Pacific Ocean, off
	ScPcSNE	36 35	...	...	...	...	...	Northern Chile.
	PSZ	38·5	...	...	...	...	...	20·5°S, 72·5°W.
	SR_{1E}	43·8	...	...	...	...	...	(U.S.C. and G.S.).
	LNE	47	...	...	...	...	...	
	M_1	56 52	30	−46	...	...	...	
	LZ	58	...	...	...	...	...	
	M_2	11 3 36	25	...	...	−48	...	
	M_3	3 41	25	...	+50	...	...	
	F	13 40	...	...	...	...	...	
19	eL	20 45	...	...	...	...	...	
	F	21 35	...	...	...	...	...	
20	eL	0 53	...	...	...	...	...	
	F	1 0	...	...	...	...	...	
21	eZ	11 2·1	...	...	...	...	...	
	LNE	25	...	...	...	...	...	
	LZ	30	...	...	...	...	...	
	F	12 10	...	...	...	...	...	

SEISMOLOGICAL DIARY :—*continued.* *Instruments.*—Two horizontal and one vertical Galitzin Seismographs with galvanometric registration.

Lat. 51° 28′ N. Long. 0° 19′ W. Height above M.S.L. 5 metres.

545. Richmond (Kew Observatory). **1929.**

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Oct.		h. m. s.	s.	μ	μ	μ	km.	
22	eL	19 31	...	...	...	...	...	
	F	50	...	...	...	...	...	
24	eE	6 57·8	...	...	...	...	...	
	eL	7 21	...	...	...	...	...	
	F	8 0	...	...	...	...	...	
29	eNE	6 12·5	...	...	...	...	...	
	LNE	16	...	...	...	...	...	
	LZ	25	...	...	...	...	...	
	F	50	...	...	...	...	...	
Nov.								
1	iPEZ	7 1 30	...	...	...	...	2030	Dilatation.
	iS	4 56	...	...	...	...	...	Felt at Bucharest.
	LNE	6·3	...	...	...	...	...	Epicentre — 46·5° N,
	LZ	9·2	...	...	...	...	...	26·5° E. (Strasbourg).
	F	55	...	...	...	...	...	
5	eNE	12 11·3	...	...	...	...	...	Off Mindanao.
	LNE	33·4	...	...	...	...	...	10°N, 126·5°E.
	LZ	44	...	...	...	...	...	(Manila).
	F	13 10	...	...	...	...	...	
8	eE	3 43·6	...	...	...	...	...	
	L	4 2	...	...	...	...	...	
	F	15	...	...	...	...	...	
9	eL	2 20	...	...	...	...	...	
	F	45	...	...	...	...	...	
13	eL	1 32	...	...	...	...	...	
	F	2 10	...	...	...	...	...	
15	iPR$_1$	19 9 59	...	...	...	...	(12000)	Caroline Islands.
	ePS	19 26	...	...	...	...	...	8° N, 143° E, (Stras-
	SR$_1$	25·9	...	...	...	...	...	bourg).
	L	45	...	...	...	...	...	
	M$_1$	47 54	32	+110	...	...	...	
	M$_2$	48 55	29	...	−99	...	...	
	M$_3$	51 21	31	+83	...	...	...	
	M$_4$	53 29	25	...	−99	...	...	
	M$_5$	53 50	22	+82	...	−51	...	
	M$_6$	20 1 21	17	...	...	+37	...	
	F	22 30	...	...	...	...	...	
17	eZ	3 57·4	...	...	...	...	...	Philippine Islands.
	e	4 8 27	...	...	...	...	...	11° N, 123·5° E.
	e	11 15	...	...	...	...	...	(J.S.A.).
	LNE	29	...	...	...	...	...	
	M$_1$	36 2	41	+73	...	...	...	
	LZ	38	...	...	...	...	...	
	M$_2$	41 58	26	−43	...	...	...	
	M$_3$	43 7	29	...	+49	...	...	
	M$_4$	53 1	22	...	−42	...	...	
	M$_5$	53 7	19	...	...	+24	...	
	F	6 40	...	...	...	...	...	
18	eLNE	6 33	...	...	...	...	...	
	eLZ	50	...	...	...	...	...	
	F	7 25	...	...	...	...	...	
18	ePEZ	20 39 10	...	...	...	...	3930	Compression. Near
	PR$_1$EZ	41 5	...	...	...	...	...	Newfoundland.
	iS	44 53	...	...	...	...	...	47°N, 58°W. (U.S.C.
	LE	47·0	...	...	...	...	...	and G.S.). ‡
	LNZ	47·6	...	...	...	...	...	
	M$_1$	51 9	23	...>	+270†	...	...	† Negative maximum
	M$_2$	51 35	19	<-290†	...	...	...	off chart.
	M$_3$	51 39	23	...	...	+520	...	
	M$_4$	51·6 to 54·8	(20)	...	>350*	...	...	* Positive and negative
	M$_5$	52·0 to 54·8	(20)	...	...	>500*	...	maxima off chart.
	M$_6$	53 48	17	+250	...	...	...	
	M$_7$	54 37	16	...	−290	...	...	
	M$_8$	55 4	15	...	...	+280	...	
	F	22 35	...	...	...	...	...	
23	eLNE	0 59	...	...	...	...	...	Earlier phases masked
	eLZ	1 10	...	...	...	...	...	by wind and
	F	50	...	...	...	...	...	microseisms.
								Epicentre about 1·7°S,
								140° E. (Manila).

Date.	Phase.	Time. G.M.T.	Period	Amplitudes. A_N.	Amplitudes. A_E.	Amplitudes. A_Z.	△	Remarks.
Dec.		h. m. s.	s.	μ	μ	μ	km.	
3	eL	8 46	...	...	...	...	...	Disturbed by wind and microseisms.
	F	9 20	...	...	...	...	...	
6	eL	12 21	...	...	...	...	...	
	F	55	...	...	...	...	...	
6	eLNE	17 30	...	...	...	...	...	
	eLZ	44	...	...	...	...	...	
	F	18 (40)	...	...	...	...	...	
6	eL	21 0	...	...	...	...	...	
	F	55	...	...	...	...	...	
9	ePZ	7 2 56	...	...	...	...	...	
	LNE	36	...	...	...	...	...	
	LZ	44	...	...	...	...	...	
	F	8 50	...	...	...	...	...	5° N, 88° E. (Manila).
13	e(P)Z	4 48	...	...	...	...	...	
	LNE	54	...	...	...	...	...	Felt at Malta.
	LZ	57	...	...	...	...	...	Epicentre — 35° N,
	F	5 20	...	...	...	...	...	14·5° E. (Strasbourg).
14	eLNE	22 33	...	...	...	...	...	
	eLZ	36	...	...	...	...	...	
	F	50	...	...	...	...	...	
15	eP	1 38 15	...	...	...	...	(2430)	
	e(S)E	42 14	...	...	...	...	...	
	LNE	43	...	...	...	...	...	
	LZ	43·2	...	...	...	...	...	
	F	2 15	...	...	...	...	...	
16	eLNE	12 28	...	...	...	...	...	
	eLZ	31	...	...	...	...	...	
	F	13 10	...	...	...	...	...	
17	eP	11 10 22	...	...	...	...	8380	Dilatation.
	PcP	10·9	...	...	...	...	...	
	iS	20 1	...	...	...	...	...	Epicentre : Between
	SR$_1$	25·1	...	...	...	...	...	Kamtchatka and
	SR$_2$	28·4	...	...	...	...	...	Aleutian Islands;
	LNE	30·5	...	...	...	...	...	55°N, 170·5°E.
	LZ	34·0	...	...	...	...	...	(Strasbourg).
	M$_1$	35 36	(38)	<−470*		...	...	
	M$_2$	35 47	18	...	+93	...	...	*Positive and negative
	M$_3$	37 59	25	...>	+160†	...	...	maxima off chart.
	M$_4$	51 21	16	...	...<	−220†	...	† Positive maxima off
	M$_5$	51 33	22	>+230†	...	...	...	chart.
	M$_6$	56 3	16	...	...<	−180†	...	(E-W maxima could
	M$_7$	12 1 13	17	...	...<	−160†	...	not be measured from
	F	16 15	...	...	...	...	...	11^h 46^m to 12^h 2^m;
								trace very faint).
17	eL	22 32	...	...	...	...	...	
	F	23 20	...	...	...	...	...	
18	eLNE	7 42	...	...	...	...	...	
	eLZ	48	...	...	...	...	...	
	F	8 25	...	...	...	...	...	
24	eLNE	5 52	...	...	...	...	...	
	eLZ	58	...	...	...	...	...	
	F	6 40	...	...	...	...	...	
30	eL	12 34	...	...	...	...	...	
	F	13 25	...	...	...	...	...	
31	LNE	2 0	...	...	...	...	...	
	eLZ	12	...	...	...	...	...	
	F	50	...	...	...	...	...	
31	eLNE	5 39	...	...	...	...	...	
	eLZ	42	...	...	...	...	...	
	F	6 25	...	...	...	...	...	
31	eL	23 22	...	...	...	...	...	
	F	40	...	...	...	...	...	

‡ A note relating to this earthquake appears in "Nature," No. 3135, dated 30/11/29.

Derived from readings for the period of thirty minutes centering at the exact hour, Greenwich Mean Time.

546. Richmond (Kew Observatory). 1929.

Month	January.								February.								March.							
Hour, G.M.T.	0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.	
	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.
Day.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.
1	1·9	5·0	1·8	5·2	2·2	5·4	2·7	4·7	2·1	5·8	2·1	6·0	1·8	6·0	...	...	1·6	6·5	1·9	5·8	2·1	6·0	1·9	6·5
2	2·2	5·4	1·9	5·8	1·6	6·5	1·7	6·7	1·5	5·6	2·1	5·8	1·6	6·5	1·4	6·0	1·9	6·5	1·6	6·5	1·6	6·3	1·2	6·3
3	1·7	6·7	1·9	6·5	1·7	6·7	1·4	7·3	1·5	5·8	1·9	5·0	1·3	5·6	2·1	6·0	0·8	6·0	1·6	6·5	1·9	6·5	1·9	6·7
4	1·6	7·3	1·8	7·0	1·4	7·5	1·3	6·7	1·7	5·8	1·3	5·8	1·1	5·6	1·0	4·8	3·4	7·3	6·1	7·5	6·3	7·7	5·3	7·0
5	1·5	7·0	1·5	6·7	1·9	6·7	1·8	7·3	0·8	6·0	0·5	4·7	0·5	4·7	0·5	4·8	3·4	7·3	1·8	7·3	2·1	5·6	1·5	7·0
6	1·9	7·3	1·4	7·5	1·7	7·5	1·8	7·3	0·6	6·0	0·7	7·5	1·5	7·0	0·9	7·0	1·5	7·0	0·8	6·0	1·2	6·3	1·2	6·5
7	1·7	7·5	1·8	7·0	1·5	7·0	1·3	7·0	1·5	7·0	1·3	7·0	1·3	5·4	1·6	5·2	0·9	5·0	...	...	0·9	5·0	1·1	5·4
8	1·8	7·0	1·8	7·0	1·8	7·0	1·4	6·5	1·6	7·3	1·5	7·0	1·2	4·8	0·8	4·0	1·1	5·2	1·5	5·8	2·2	4·1	1·6	5·2
9	1·5	6·7	1·4	6·5	1·4	6·3	1·2	4·8	1·7	5·8	1·4	6·0	1·4	6·0	1·6	6·5	1·5	5·8	0·7	5·0	...	...	0·5	4·7
10	0·9	5·6	0·6	6·3	0·4	6·3	1·0	6·0	1·6	7·3	1·9	7·3	1·9	6·7	1·8	5·4	0·4	5·4	0·4	5·6	0·5	5·0	0·5	4·8
11	0·4	5·6	0·3	4·3	0·7	3·0	0·6	3·7	2·1	5·8	2·1	5·8	1·9	6·5	2·4	5·6	0·4	5·6	0·6	6·5	0·4	5·4	0·6	6·7
12	1·3	4·3	0·7	4·7	0·8	4·3	0·8	4·3	3·0	6·3	5·4	4·7	3·1	6·0	4·9	4·7	0·5	7·3	0·6	6·7	...	...	0·6	6·5
13	1·0	4·7	1·0	4·7	0·8	8·0	0·4	5·4	2·9	5·4	4·2	5·4	6·0	5·4	6·9	5·4	0·4	6·0	0·6	6·3	0·8	6·5	0·3	7·5
14	0·6	6·0	0·4	5·4	0·6	6·0	0·6	5·8	5·9	5·2	4·1	5·6	3·0	5·2	2·5	4·7	0·9	6·7	0·4	6·0	0·4	5·4	0·4	6·7
15	0·6	6·3	0·8	4·5	0·9	5·2	1·6	5·2	2·3	5·2	2·4	4·3	2·9	4·3	2·2	5·4	0·4	6·3	0·2	5·6	0·6	6·3	0·4	6·5
16	1·2	6·3	1·8	6·3	1·8	6·0	1·5	5·8	1·8	6·0	1·6	6·0	2·1	5·6	2·1	6·7	0·4	6·3	0·4	6·5	0·4	6·7	0·4	6·0
17	2·0	5·4	1·6	5·2	1·4	6·3	1·6	7·5	1·8	5·4	1·4	6·5	1·4	6·3	1·4	5·0	0·4	5·8	0·6	6·7	0·4	5·6	0·5	4·8
18	1·6	7·5	1·4	6·3	1·3	7·0	1·5	7·0	1·8	5·4	1·4	5·0	1·6	5·2	1·9	4·8	0·4	5·6	0·4	6·0	0·6	6·0	0·4	5·6
19	1·7	8·0	2·6	7·5	1·7	8·0	1·7	7·5	1·9	5·0	1·9	5·8	2·2	4·8	1·6	5·0	...	...	0·4	5·6	0·4	5·4	0·4	6·0
20	1·8	7·3	1·8	7·3	1·9	6·7	1·8	7·0	1·7	5·6	...	...	2·2	5·4	1·8	6·0	0·2	6·0	0·4	5·6	0·3	4·5	0·2	5·0
21	1·5	6·7	1·6	6·0	0·6	6·0	1·0	6·3	2·1	5·6	1·8	7·3	1·7	6·5	1·4	6·5	0·2	5·0	0·4	6·0	0·5	4·3	1·1	7·0
22	0·7	5·2	1·2	7·3	1·2	6·5	1·0	6·0	1·4	7·3	1·5	6·7	1·8	5·4	1·3	4·5	1·3	6·7	1·7	6·5	1·9	6·7	1·9	7·3
23	0·8	6·0	1·4	7·3	1·4	7·0	1·1	6·7	0·7	7·5	1·3	5·8	0·5	7·0	0·9	7·0	1·8	7·3	1·6	7·0	1·8	7·0	1·7	6·7
24	1·5	7·0	1·3	7·0	1·3	6·7	1·3	6·7	1·3	7·0	0·9	7·0	1·2	6·5	1·5	5·6	0·9	6·7	0·8	6·5	0·6	5·6	0·8	6·0
25	1·1	7·3	0·7	7·0	0·9	7·5	0·6	6·0	1·5	6·7	1·3	7·0	1·3	7·0	0·8	6·0	1·0	6·3	1·6	6·5	1·2	6·0	1·6	6·0
26	1·7	6·7	1·9	5·0	1·6	6·5	1·6	6·3	1·8	4·5	1·5	6·7	1·8	7·0	2·2	7·7	1·2	6·0	1·6	6·0	1·6	6·5	1·7	6·7
27	1·6	6·5	1·6	6·0	1·8	6·0	2·0	7·0	2·6	9·0	3·2	4·7	5·2	4·7	5·1	5·4	1·7	6·7	1·9	6·7	1·8	7·3	1·6	7·3
28	2·9	6·5	3·7	7·0	2·8	6·7	2·2	7·0	4·7	5·0	3·1	4·8	2·0	4·7	1·6	5·2	1·7	6·7	1·6	7·0	1·4	6·0	0·6	6·0
29	2·3	5·0	1·9	6·5	2·3	5·2	2·1	5·8									0·6	6·0	0·7	5·2	0·4	6·0	0·5	5·2
30	2·2	5·4	2·7	5·4	2·7	6·5	3·1	6·0									0·6	5·6	0·6	5·6	0·5	7·0	0·8	6·0
31	2·5	6·0	3·4	5·6	1·9	6·5	2·9	6·0									0·6	5·8	0·6	6·0	0·8	6·0	1·3	5·6
Mean ...	1·5	6·3	1·6	6·2	1·5	6·4	1·5	6·2	2·0	6·1	2·0	6·0	2·0	5 8	2·0	5·6	1·1	6·2	1·1	6·2	1·2	6·0	1·1	6·2
Mean for day ...	A = 1·5μ ; Tp = 6·3 s.								A = 2·0μ ; Tp = 5·9 s.								A = 1·1μ ; Tp = 6·1 s.							

Month.	April.								May.								June.							
Hour, G.M.T.	0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.	
	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.
Day.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.
1	1·3	5·4	0·8	5·8	0·6	5·6	0·4	2·7	0·3	3·9	0·3	3·9	0·4	6·0	...	...	0·3	3·2	0·3	4·3	0·3	3·5	0·6	4·0
2	0·5	4·1	0·5	4·1	1·1	5·2	1·0	4·7	0·5	5·2	0·5	4·7	0·7	3·3	0·6	3·5	0·6	5·6	0·9	5·6	1·0	6·0	1·5	5·4
3	0·8	6·0	0·7	7·5	0·5	4·3	0·4	5·4	0·6	3·6	0·9	3·9	0·9	3·5	0·7	3·3	1·7	5·8	1·4	6·0	1·0	4·8	0·7	5·0
4	0·7	5·0	0·6	6·0	0·7	5·4	0·6	6·0	0·7	3·3	0·3	3·9	0·5	4·1	0·6	4·0	0·7	4·7	0·7	4·7	1·0	4·7	0·7	5·2
5	0·4	5·4	0·5	5·2	0·2	4·8	0·7	3·3	0·5	5·0	0·6	4·0	0·6	3·7	0·5	4·3	1·1	5·2	1·1	5·4	0·9	5·0	0·7	4·8
6	0·3	3·1	0·5	4·3	0·9	5·6	0·7	5·2	0·7	4·7	1·4	4·1	1·3	4·3	1·3	4·3	0·6	3·7	0·7	4·7	0·8	4·3	0·8	4·1
7	0·9	5·6	0·9	5·4	0·5	5·2	0·2	4·8	1·4	6·0	1·6	5·0	0·8	4·3	...	...	0·8	4·1	0·8	4·3	0·9	3·9	0·5	4·5
8	0·5	4·7	0·7	5·2	0·5	5·0	0·5	4·8	0·8	4·3	0·9	3·7	0·6	5·6	0·5	5·0	1·1	4·3	0·9	5·2	0·7	4·7	0·5	4·7
9	0·5	4·1	0·5	4·3	0·8	5·8	0·5	4·7	0·2	4·7	0·5	4·7	0·2	4·7	0·5	5·0	0·5	4·8	0·3	4·5	0·2	4·7	0·3	4·3
10	0·4	6·3	0·6	6·0	0·7	5·0	0·5	4·1	0·8	4·3	1·1	5·2	1·5	5·4	1·7	5·6	0·3	4·5	0·3	4·0	0·5	5·0	0·9	5·6
11	0·5	4·7	0·6	3·7	0·5	4·3	0·3	4·1	2·1	5·0	1·6	6·0	1·8	5·4	1·3	5·8	1·0	6·0	0·7	4·7	...	...	1·0	4·8
12	0·6	3·5	0·5	4·1	0·6	5·6	0·8	4·0	1·0	5·8	0·7	5·4	1·0	4·8	0·7	5·4	0·7	4·8	0·7	4·8	...	...	0·7	4·8
13	0·9	5·4	0·9	5·6	0·8	6·7	1·1	5·6	0·7	5·2	1·0	4·7	0·8	4·3	0·7	4·7	...	...	0·9	5·6	0·9	3·9	0·8	4·5
14	1·6	5·0	1·6	5·0	1·8	6·0	1·7	5·6	1·7	7·5	1·8	6·0	2·1	5·0	1·6	6·5	0·8	4·3	0·4	5·8	0·8	4·3	0·5	4·3
15	1·6	6·0	1·5	5·8	2·1	5·0	0·9	5·4	1·6	5·0	1·4	5·0	1·9	5·0	0·9	5·0	0·8	4·5	1·1	4·1	0·5	4·5	0·8	4·3
16	0·6	5·6	0·6	6·0	1·9	5·6	0·7	5·4	0·9	5·0	0·7	5·4	1·0	4·7	0·5	4·7	0·7	4·7	0·8	4·3	0·7	5·0	0·8	4·5
17	0·4	5·6	0·4	5·8	0·6	6·5	0·4	5·6	0·5	4·8	0·5	4·8	0·4	5·4	0·5	5·2	...	...	0·5	4·3	0·6	4·0	0·3	4·3
18	0·3	4·3	0·5	4·8	0·4	5·4	1·0	6·6	0·4	5·4	0·7	5·0	0·6	6·5	0·7	5·4	0·5	4·7	0·5	4·7	0·5	4·7	0·2	5·0
19	1·3	5·8	1·0	6·3	0·6	6·5	1·3	6·7	0·6	3·7	0·6	3·5	0·3	3·3	0·2	4·7	0·2	4·8	0·2	4·7	0·2	4·7	0·2	4·7
20	1·4	6·5	1·1	5·6	1·4	5·0	1·9	4·8	0·2	4·7	...	...	0·2	5·6	0·2	5·0	0·3	4·3	0·3	4·3	0·2	4·7	0·6	3·7
21	1·1	5·4	1·9	4·8	1·5	4·8	1·8	5·2	0·4	5·8	0·7	7·3	1·2	7·3	...	...	0·2	5·0	0·2	4·8	0·3	4·3	0·3	4·0
22	1·6	5·0	1·1	5·6	1·0	4·8	1·1	5·4	1·2	6·3	1·1	5·2	0·2	5·0	...	...	0·3	4·0	0·3	4·0	0·3	4·1	0·3	3·3
23	1·3	7·0	0·8	5·8	0·6	6·0	0·6	5·8	...	...	...	...	1·2	5·0	1·0	5·8	0·3	4·0	0·3	4·0	0·4	5·4	0·5	4·1
24	0·7	4·7	0·3	4·3	0·3	3·6	0·3	3·3	1·1	7·0	0·8	6·7	0·9	5·6	0·8	6·3	0·3	3·2	0·4	2·6	0·7	3·3	0·8	4·5
25	0·4	5·8	0·5	4·1	0·8	6·0	0·9	5·0	0·6	5·6	0·5	5·0	0·5	5·0	0·5	5·2	0·8	4·3	0·8	4·3	0·7	3·2	0·5	4·3
26	0·7	5·4	0·5	5·2	0·5	5·0	0·2	5·6	0·5	5·2	0·7	7·0	0·6	6·0	0·6	6·0	0·5	4·5	0·3	4·0	0·3	3·3	...	...
27	0·2	4·7	0·6	3·6	0·6	6·5	0·7	7·0	...	...	0·7	5·2	0·7	5·0	0·2	5·4	0·3	3·5	0·3	4·0	0·3	4·0	...	...
28	0·4	6·0	0·2	4·8	0·5	5·0	0·5	4·3	0·5	5·2	0·4	5·4	0·3	4·0	0·3	4·1	0·3	4·3	0·3	4·0	0·3	3·7	0·3	3·3
29	0·5	5·0	0·6	4·0	0·6	3·7	0·3	4·0	0·3	4·0	0·3	4·3	0·3	4·5	0·2	4·8	0·3	3·3	0·4	3·0	0·3	3·3	0·6	3·9
30	0·3	4·0	0·3	3·7	0·2	4·7	0·3	3·5	0·3	4·1	0·5	4·1	0·5	5·0	0·8	4·5	1·6	4·3	1·7	4·0	1·9	4·3	1·4	4·0
31									...	...	...	...	0·3	3·5	0·3	3·5								
Mean ...	0·8	5·2	0·7	5·1	0·8	5·3	0·7	4·9	0·7	5·0	0·8	5·0	0·8	4·9	0·7	4·9	0·6	4·4	0·6	4·5	0·6	4·3	0·6	4·4
Mean for day ...	A = 0·7μ ; Tp = 5·1s.								A = 0·7μ ; Tp = 4·9s.								A = 0·6μ ; Tp = 4·4s.							

NOTE.—The symbol ... indicates that microseisms were not measured, either by reason of occurrence of earthquake or lack of record.

Derived from readings for the period of thirty minutes centering at the exact hour, Greenwich Mean Time.

546. Richmond (Kew Observatory). **1929.**

Month	July.								August.								September.							
Hour. G.M.T.	0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.	
	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.
Day.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.
1	1·1	4·0	0·8	4·0	0·3	3·6	...	...	2·1	5·0	1·4	4·1	1·6	4·3	1·9	4·1	0·3	4·0	0·6	3·7	0·3	3·7	0·6	4·0
2	0·4	3·0	0·0	—	0·0	—	0·0	—	2·1	3·7	0·8	4·0	0·8	4·1	1·0	4·7	0·5	4·1	0·6	5·6	...	...	0·9	3·9
3	0·0	—	0·0	—	0·3	3·5	0·3	4·3	0·8	4·5	0·8	4·1	0·6	4·3	1·5	4·1	1·3	4·3	0·8	4·1	0·8	4·1	0·8	4·1
4	0·2	5·0	0·3	3·7	0·3	3·3	0·4	2·5	0·9	4·3	0·9	4·1	1·3	4·5	1·2	3·7	0·3	4·3	0·3	3·9	0·3	3·9	0·3	3·7
5	0·4	2·5	0·8	4·3	...	...	0·6	3·5	1·4	3·2	0·9	3·7	0·9	3·7	0·5	4·3	0·3	3·9	0·2	4·8	0·3	4·5	0·3	4·0
6	...	...	0·9	3·5	1·0	3·2	0·7	3·0	0·6	3·6	0·4	2·9	0·7	3·2	1·1	4·1	0·6	4·0	0·7	4·8	0·9	5·0	0·5	4·7
7	0·7	3·0	0·6	3·7	0·4	3·0	0·3	3·1	0·9	3·7	0·8	2·6	0·7	3·2	0·7	3·2	0·8	5·8	0·7	5·0	0·5	5·0	0·4	6·0
8	...	...	0·5	4·7	0·3	3 3	0 3	4·3	0·6	3·9	0·3	4·5	0·5	4·3	0·6	4·0	0·5	5·0	0·4	5·4	0·5	4·5	0·3	4·0
9	0·3	3·7	0·3	3·3	0·3	4·3	0·3	3·7	0·5	4·1	0·3	3·7	0·3	4·5	0·3	4·3	0·5	5·2	0·2	4·7	0·3	4·5	0·2	5·0
10	0·7	4·8	0·5	4·3	0·6	4·0	0·5	4·5	0·3	4·3	0·3	4·5	0·3	4·5	0·3	4·3	0·3	4·5	0·3	4·3	0·3	4·3	0·3	4·1
11	0·6	4·0	0·5	4·5	0·5	4·5	0·5	4·8	0·3	4·5	0·3	4·3	0·3	4·3	0·3	4·1	0·3	4·5	0·2	4·7	0·3	3·7	0·3	3·9
12	0·3	4·3	0·2	4·7	0·3	4·0	0·3	4·1	0·3	4·3	0·3	4·0	0·3	4·0	0·3	3·9	0·3	3·7	0·3	4·5	0·3	4·0	0·3	4·5
13	0·3	4·0	0·2	4·7	0·3	4·0	0·3	4·1	0·3	4·1	0·3	4·0	0·3	4·3	0·3	4·5	0·5	4·7	0·3	3·9	0·5	4·3	0·8	4·1
14	0·2	5·2	0·5	4·5	0·5	5·0	0·5	4·3	0·3	4·3	0·3	3·6	0·4	2·9	0·3	3·2	1·2	5·8	1·5	5·6	1·2	6·0	1·2	6·5
15	0·2	5·2	0·3	4·3	0·3	4·3	0·0	—	0·3	3·7	0·3	4·0	0·3	4·1	0·3	4·3	1·2	6·5	1·5	6·7	1·4	6·0	1·0	6·5
16	0·3	3·6	0·3	3·1	0·4	3·0	0·4	3·0	0·3	4·3	0·3	4·3	0·3	4·5	0·3	4·3	1·2	6·5	1·0	6·0	1·4	6·5	1·3	7·0
17	0·3	3·3	0·3	3·3	0·3	4·0	0·3	3·3	0·6	4·0	0·8	4·0	0·5	4·1	0·6	3·7	0·9	6·7	0·7	5·4	0·7	5·4	1·0	6·0
18	0·3	3·3	0·3	4·0	0·3	4·1	0·3	3·9	...	...	0·6	3·5	1·0	3·2	0·6	3·5	0·9	5·6	1·1	5·6	0·9	5·6	1·3	6·7
19	0·3	4·5	0·3	4·3	0·3	3·7	0·3	3·5	0·3	3·2	0·3	3·5	0·3	3·5	0·3	3·7	1·4	6·3	1·1	5·4	1·7	5·8	1·4	6·3
20	0·3	4·1	0·3	4·3	0·3	4·0	0·3	4·3	0·3	4·3	0·3	4·1	0·3	4·3	...	...	1·0	6·3	0·9	5·0	1·6	5·0	2·2	4·8
21	0·2	4·7	0·3	4·1	0·6	4·0	0·5	4·3	0·2	4·7	0·3	4·5	0·2	4·8	0·3	4·3	1·6	5·0	1·9	4·8	1·7	5·6	2·1	5·8
22	0·4	5·6	0·2	5·2	0·3	4·3	0·8	4·3	0·3	3·9	0·3	3·9	0·4	5·6	0·7	5·2	1·9	5·8	1·8	5·0	1·1	5·4	0·7	5·0
23	0·8	4·3	1·0	4·5	0·9	3·7	0·6	4·0	0·6	6·0	0·9	5·0	0·9	5·0	1·0	4·7	0·8	4·5	0·5	5·0	0·5	4·7	0·7	5·0
24	0·7	3·3	0·3	4·3	0·3	4·1	0·5	5·0	0·6	5·8	0·5	4·1	0·7	3·3	0·8	4·3	0·9	5·6	1·4	6·3	1·7	5·6	1·4	6·0
25	0·3	4·0	0·3	3·7	0·4	2·7	0·3	3·3	0·5	4·1	0·5	4·5	0·3	3·5	0·5	5·0	1·3	6·7	0·8	6·0	0·7	5·4	0·6	5·6
26	0·4	3·0	0·4	3·0	0·4	2·9	0·3	3·2	0·3	4·0	0·3	4·0	0·3	3·6	0·3	3·5	0·6	5·8	...	...	0·6	5·6	0·2	5·4
27	...	...	0·3	3·9	0·3	3·7	0·3	3·7	0·3	3·6	0·3	3·3	0·3	3·5	0·3	3·7	0·5	4·7	0·2	5·0	0·2	4·8	0·2	5·0
28	0·3	4·3	0·3	3·5	0·3	4·0	0·3	3·7	0·3	3·7	0·6	4·0	0·3	3·9	0·5	4·3	...	...	0·7	5·0	1·7	5·6	3·5	7·3
29	0·4	2·8	0·6	3·7	0·4	2·6	0·5	4·3	0·6	4·0	0·5	4·5	0·6	3·9	0·5	4·3	2·1	7·3	1·8	7·0	1·7	6·5	1·5	5·6
30	0·3	3·7	0·5	4·3	0·3	3·5	0·5	4·7	0·3	3·7	0·6	3·9	0·5	4·3	0·8	4·0	0·6	6·3	1·2	6·0	0·9	5·0	1·1	5·4
31	0·5	4·3	0·8	4·5	1·3	4·3	1·4	5·2	2·0	4·5	1·6	4·3	0·8	4·0	0·8	4·3								
Mean ...	0·4	4·0	0·4	4·1	0·4	3·7	0·4	3·9	0·6	4·2	0·5	4·0	0·5	4·0	0·6	4·1	0·9	5·3	0·8	5·1	0·9	5·0	0·9	5·2
Mean for day ...	A = 0·4μ ; Tp = 3·9s.								A = 0·5μ ; Tp = 4·1s.								A = 0·9μ ; Tp = 5·1s.							

Month	October.								November.								December.							
Hour. G.M.T.	0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.		0 h.		6 h.		12 h.		18 h.	
	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.	A.	Tp.
Day.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.	μ	s.
1	1·0	6·0	1·7	4·7	0·7	5·0	1·4	5·0	0·8	4·1	0·5	4·8	1·2	7·5	1·1	7·0	0·9	5·6	0·7	7·5	1·6	8·3	1·3	8·0
2	1·5	4·7	2·2	4·7	1·9	6·5	1·7	5·8	1·3	7·0	1·5	6·7	1·7	6·7	1·7	6·7	2·0	7·7	1·8	7·0	3·8	5·6	3·5	6·5
3	1·7	5·8	2·0	4·7	0·8	4·5	0·7	5·4	2·2	7·0	1·7	7·5	2·3	7·3	1·8	7·0	4·1	8·0	3·7	9·0	4·9	8·7	4·8	8·3
4	2·0	4·5	2·9	4·7	1·9	6·7	1·7	5·8	1·5	6·7	1·5	6·7	0·7	5·0	0·8	5·8	4·2	8·7	3·7	8·3	4·5	7·0	3·5	7·3
5	1·4	6·0	1·7	5·6	0·9	5·2	0·8	4·3	1·8	5·4	1·5	4·5	1·5	5·4	1·9	5·8	5·4	7·5	5·0	9·3	5·5	7·0	5·4	7·5
6	2·5	4·5	2·9	4·8	4·2	5·0	2·3	5·0	2·1	5·6	1·8	6·0	1·9	5·6	1·7	6·5	7·0	7·7	4·8	7·7	5·2	7·5	6·1	7·5
7	2·4	4·7	2·0	4·7	2·4	4·7	1·7	4·8	2·0	6·3	1·9	6·5	1·9	6·7	1·6	6·3	5·2	7·5	4·3	7·5	7·3	6·0	3·1	7·5
8	1·2	4·7	2·4	4·7	2·8	4·0	2·4	4·3	1·5	5·8	1·4	6·0	2·0	6·0	2·1	6·5	3·9	6·3	3·7	7·3	4·4	7·7	4·5	7·0
9	2·0	4·7	1·8	5·2	1·2	5·0	0·8	4·5	2·1	6·7	2·1	6·5	2·4	6·0	2·4	8·3	5·8	8·3	4·8	8·0	4·8	7·5	4·9	6·3
10	1·6	4·3	1·9	6·7	2·1	5·8	1·9	6·7	3·5	7·5	2·6	7·5	3·5	7·5	3·1	7·5	3·2	5·6	2·0	6·0	2·6	5·6	1·7	7·5
11	1·7	5·6	0·7	5·4	1·0	4·7	1·0	4·7	3·5	7·5	3·2	7·3	3·4	7·7	2·9	6·3	1·9	6·5	2·2	6·3	2·5	9·3	2·7	8·0
12	0·7	5·2	0·5	5·0	0·9	5·0	1·0	4·7	3·7	6·0	4·2	5·0	3·1	6·0	3·2	6·7	2·2	7·5	3·3	7·0	2·1	7·3	3·0	8·0
13	0·7	5·0	0·5	4·7	0·7	4·7	0·7	5·4	2·4	6·3	2·2	5·4	3·0	6·7	2·5	6·3	2·7	7·7	3·6	7·0	2·0	7·0	1·9	6·7
14	0·5	5·0	0·5	4·7	0·5	4·7	0·5	4·8	1·7	6·5	2·0	6·0	1·8	6·0	1·8	6·0	1·0	6·3	2·1	6·5	2·2	7·0	1·7	6·5
15	0·5	4·8	0·7	5·2	0·8	4·5	0·7	5·0	1·5	5·6	1·7	4·7	1·5	4·7	2·1	5·6	1·3	5·6	1·1	5·4	0·8	6·3	0·8	6·3
16	0·5	5·0	0·5	5·0	0·7	4·7	1·1	4·3	2·2	4·8	2·2	5·4	1·1	5·6	1·7	6·7	0·9	5·4	0·9	5·2	0·9	5·2	0·9	5·2
17	1·2	4·7	1·3	4·5	1·1	4·5	0·6	4·0	2·0	4·7	0·5	4·5	0·4	5·8	0·7	5·0	0·9	5·2	0·7	5·2	...	...	0·9	5·6
18	0·5	4·7	0·5	4·7	0·6	4·3	0·5	4·7	0·6	5·8	1·9	5·8	3·5	5·0	3·5	7·3	0·9	5·2	0·7	5·2	0·4	5·6	0·8	6·0
19	0·5	4·8	0·6	4·3	...	...	0·5	4·3	2·5	6·3	4·1	5·2	2·4	6·0	2·0	7·0	1·3	4·5	0·8	6·0	1·7	5·8	2·0	5·4
20	0·5	4·8	0·7	5·0	1·3	4·3	2·2	5·4	2·3	6·5	3·5	5·4	2·2	6·7	2·1	6·7	2·0	6·3	1·6	6·3	1·8	5·2	2·5	6·3
21	1·9	6·7	1·8	5·2	0·8	4·1	1·8	6·0	2·4	6·7	2·0	6·3	1·8	6·0	1·3	7·0	3·3	5·4	3·1	6·5	2·8	6·7	3·3	7·0
22	1·6	6·0	0·9	3·9	1·6	7·5	1·9	6·7	1·5	5·6	1·7	5·6	1·5	4·5	1·8	5·0	3·9	6·3	2·5	6·5	3·5	7·0	2·8	6·7
23	1·5	6·5	1·4	6·3	1·6	6·0	1·4	6·0	2·1	5·0	2·0	5·4	1·8	4·5	2·2	5·4	2·4	6·3	2·5	6·5	2·0	7·0	1·9	6·5
24	1·7	5·8	2·2	5·4	1·8	5·2	2·3	5·0	2·1	5·6	2·4	7·0	2·1	6·5	1·9	6·7	1·9	6·5	2·5	7·0	2·7	6·5	4·2	6·5
25	2·2	4·8	2·1	5·0	1·9	5·6	2·0	6·3	2·1	5·6	2·8	5·0	2·0	6·3	1·9	6·7	4·1	6·0	4·3	6·0	4·3	6·0	5·3	6·3
26	1·6	7·5	1·7	6·7	2·3	5·0	1·8	6·0	1·9	6·7	2·3	5·6	2·2	5·4	2·3	5·0	4·9	7·0	4·4	7·0	3·6	6·7	4·7	6·7
27	2·2	4·8	2·0	4·7	2·6	3·9	1·3	4·3	2·1	5·6	2·1	5·8	1·9	6·7	1·8	5·0	3·1	7·7	2·8	7·5	2·2	7·0	5·3	8·0
28	1·3	4·5	1·4	5·0	1·9	4·8	3·2	5·0	2·1	5·0	2·3	5·2	2·0	6·0	2·6	5·4	6·0	8·7	4·7	8·7	5·1	8·0	4·2	8·3
29	1·9	6·7	2·1	6·5	2·3	5·0	2·3	5·0	2·2	5·4	1·8	5·0	1·8	7·3	2·2	6·0	3·6	7·0	3·0	7·3	3·3	7·5	3·9	6·3
30	1·7	6·5	1·7	5·8	2·1	4·3	0·7	4·7	2·0	6·0	1·5	6·7	1·6	6·0	1·5	5·4	3·1	7·5	3·4	7·7	3·1	6·5	2·0	6·3
31	1·2	5·0	1·0	4·5	0·8	4·3	0·5	4·8																
Mean ...	1·4	5·3	1·5	5·1	1·5	5·0	1·4	5·1	2·1	6·0	2·1	5·8	2·0	6·1	2·0	6·3	2·3	6·5	2·0	5·2	1·4	6·5	1·2	6·3
Mean for day ...	A = 1·5μ ; Tp = 5·1s.								A = 2·1μ ; Tp = 6·1s.								3·1	6·7	2·8	6·9	3·1	6·8	3·1	6·9
																	A = 3·0 μ ; Tp = 6·8s.							

NOTE.—The symbol ... indicates that microseisms were not measured, either by reason of occurrence of earthquake or lack of record.