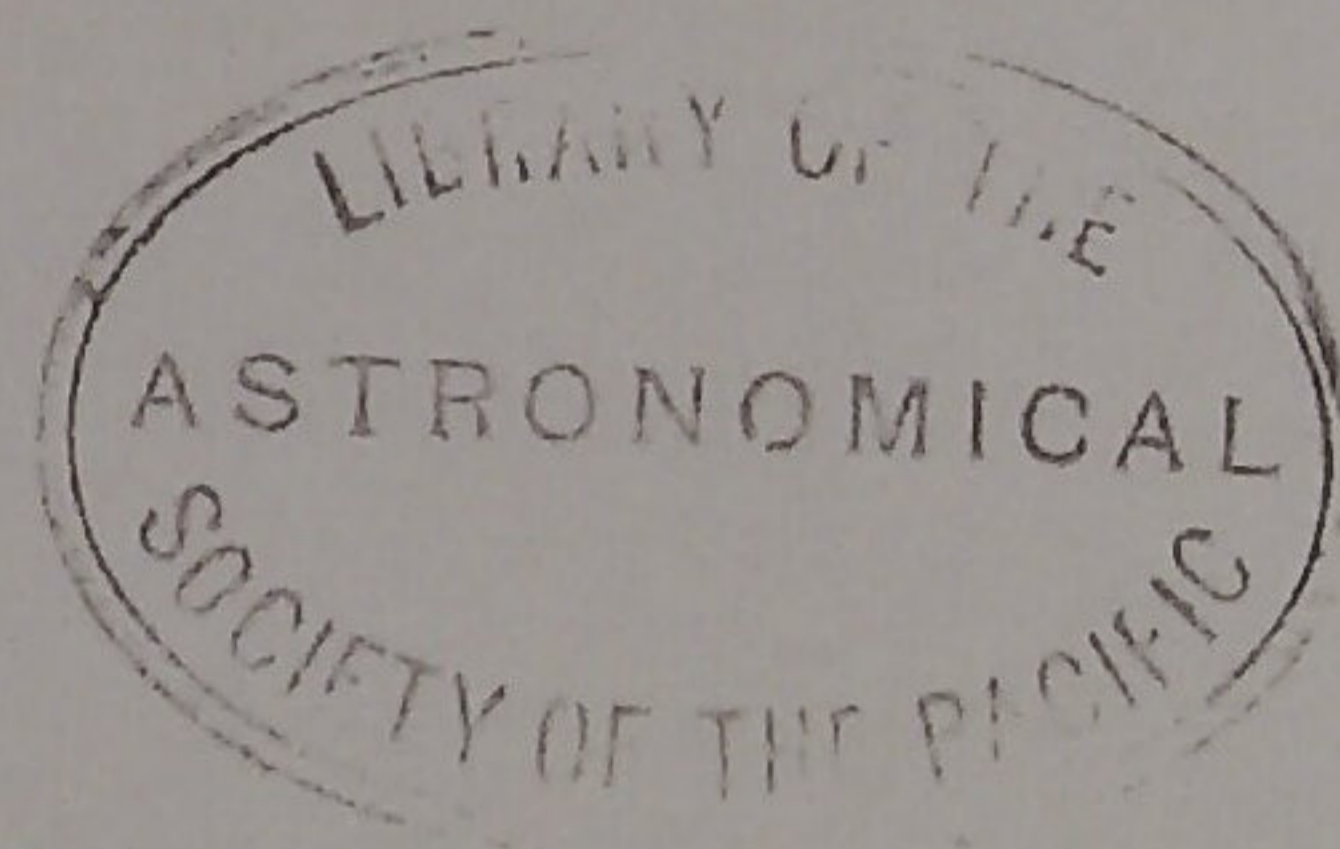
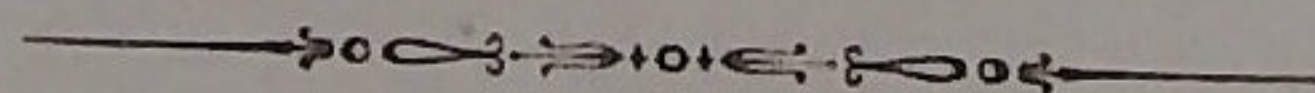


ANNUAL REPORT
OF THE
METEOROLOGICAL
AND THE
SEISMOLOGICAL OBSERVATIONS
MADE AT THE
INTERNATIONAL LATITUDE OBSERVATORY
OF MIZUSAWA
FOR
THE YEAR 1919.



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LATITUDE 39° 8' N., LONGITUDE 141° 7' E.,  
HEIGHT ABOVE MEAN SEA LEVEL 61 METRES.



PUBLISHED BY THE INTERNATIONAL LATITUDE OBSERVATORY  
OF MIZUSAWA.

1920.



The present report contains the results of the meteorological and the seismological observations in the observatory during the year 1919. No alteration is done in the kinds and the methods of observations. The observations and the computations were done by Messrs. K. Torihata, K. Kusano and K. Kokuda under the superintendence of Dr. M. Hashimoto and Dr. Y. Ueta.

The followings are to be generally noticed with respect to the meteorological observations :

*Hours of observations.*—The *Japanese Central Standard Time* (mean time of the meridian 9h east from Greenwich) is adopted.

*Air Pressure.*—The barometric readings in millimetres are reduced only to freezing point of water ; the corrections to sea level and to standard gravity are given at the bottoms of the respective pages.

*Air and Earth Temperatures.*—The degrees are given in Centigrades.

*Wind.*—The velocity is expressed in metres per second. The direction is observed according to the sixteen cardinal points.

*Cloud.*—The amount is estimated by the scale 0-10, the forms are of the *International classification*, and the direction of motion is observed according to the eight cardinal points.

*Tension of Water Vapour.*—It is given in millimetres.

*Relative Humidity.*—It is given in percentages.

*Precipitation.*—The amount is given in millimetres. The number of days is counted only when the amount is 0.1 mm. or more in a day ; but for those days with either snow, hail, or graupel, the amount is not taken into consideration.

*Clear and Cloudy Days.*—The mean amount of cloud is less than 2 exclusive for the former, and more than 8 inclusive for the latter.

*Duration of Sunshine.*—It is recorded by a sunshine-recorder of *Jordan's* pattern.

*Amount of Evaporation.*—It is given in millimetres, the daily amount being, according to the instruction of the Central Meteorological Observatory in Tokyo, that which results from 10h of the preceding day till 10h of the day in question.

The occurrence of meteorological phenomena is recorded with the following symbols :

|   |                           |   |                          |    |                |
|---|---------------------------|---|--------------------------|----|----------------|
| ● | Rain                      | + | Snow drift               | c  | Cirrus         |
| * | Snow                      | ← | Ice crystals             | cs | Cirro-stratus  |
| ⚡ | Thunder storm             | ⊙ | Solar corona             | ck | Cirro-cumulus  |
| ⚡ | Thunder without lightning | ⊕ | Solar halo               | kc | Cumulo-cirrus  |
| < | Lightning without thunder | ☾ | Lunar corona             | sc | Strato-cirrus  |
| △ | Graupel                   | ☽ | Lunar halo               | sk | Strato-cumulus |
| ▲ | Hail                      | ☼ | Gales                    | n  | Nimbus         |
| ≡ | Mist, fog                 | ☁ | Rainbow                  | k  | Cumulus        |
| ⊥ | Hoar frost                | ☀ | Aurora                   | kn | Cumulo-nimbus  |
| ⋈ | Dew                       | ∞ | Dust haze                | s  | Stratus        |
| ∇ | Silver thaw               | ☄ | Snow Lying               | ~  | Wave cloud     |
| ~ | Glazed frost              | ⊥ | Ice Column in the ground | ☾  | Zodiacal light |

The descriptions of the meteorological instruments are found in the annual reports for the years 1902, 1904, 1905, 1910, and 1916.

The seismological instruments in use are two Omori's horizontal pendulums, of the same type as that described in p. 8 of No. 5, "Publication of the Earthquake Investigation Committee in Foreign Language," one serving to register the EW component, and the other the NS component, of seismological movements. The instrumental constants are as follows:

|                                                                                  | EW Component    | NS Component    |
|----------------------------------------------------------------------------------|-----------------|-----------------|
|                                                                                  | Apparatus       | Apparatus       |
| Period of free oscillation                                                       | 16 seconds      | 37 seconds      |
| Multiplication of the pointer                                                    | 100 times       | 20 times        |
| Weight of heavy cylinder                                                         | 45.0 kilograms  | 17.6 kilograms  |
| Horizontal distance of the centre of the<br>cylinder from the point of support } | 20 centimetres  | 75 centimetres  |
| Vertical distance between the points of<br>support and of suspension }           | 104 centimetres | 104 centimetres |

The time adopted in the observations is the Japanese Central Standard Time reckoned from midnight.

April, 1920.

H. Kimura, *Rigakuhakushi*

Director of the International Latitude Observatory  
of Mizusawa.

**SEISMOLOGICAL OBSERVATIONS.**

TABLE A.

(Earthquakes)

International  
Seismological  
Centre

| No. | Date<br>1919 | Time of Occurrence |      |    |      | Beginning of<br>the Principal portion |    |    |     | Duration<br>of<br>Total<br>Earthquake<br>(mean) | Maximum<br>Range Motion |       |      | Character<br>of<br>Motion | Intensity | Remarks |      |
|-----|--------------|--------------------|------|----|------|---------------------------------------|----|----|-----|-------------------------------------------------|-------------------------|-------|------|---------------------------|-----------|---------|------|
|     |              | E                  | W    | N  | S    | E                                     | W  | N  | S   |                                                 | E                       | W     | N    |                           |           |         | S    |
| 1   | Jan. 1       | 10                 | 40   | 32 | 40   | 32                                    | 10 | 46 | 05* | 46                                              | 01*                     | 59.4  | 0.19 | 0.90                      | Slow      | Feeble  |      |
| 2   | 1            | 12                 | 10   | 44 | 10   | 52                                    | 12 | 19 | 48  | 19                                              | 55                      | 193.6 | 1.43 | 2.86                      | "         | "       |      |
| 3   | 1            | 13                 | 50.6 |    |      |                                       |    |    |     |                                                 |                         | 3.8   | 0.01 |                           | "         | "       |      |
| 4   | 1            | 23                 | 30   | 26 |      |                                       | 23 | 30 | 59  | 30                                              | 59                      | 4.7   | 0.02 | 0.02                      | "         | "       |      |
| 5   | 3            | 12                 | 54   | 35 |      |                                       | 12 | 56 | 16  | 56                                              | 18                      | 7.4   | 0.06 | 0.10                      | "         | "       |      |
| 6   | 4            | 18                 | 21   | 22 | 21   | 24                                    | 18 | 22 | 08  | 22                                              | 09                      | 7.2   | 0.08 | 0.11                      | "         | "       |      |
| 7   | 6            | 9                  | 27   | 09 | 27.8 |                                       | 9  | 29 | 08  | 29                                              | 09                      | 8.8   | 0.04 | 0.04                      | "         | "       |      |
| 8   | 7            | 7                  | 23   | 50 | 23.8 |                                       | 7  | 23 | 59  | ?                                               |                         | 3.0   | 0.03 | 0.02                      | "         | "       |      |
| 9   | 7            | 7                  | 33   | 39 | 33   | 53                                    | 7  | 39 | 58* | 40                                              | 34*                     | ?     | 0.02 | ?                         | "         | "       |      |
| 10  | 12           | 22                 | 22   | 05 | 22   | 06                                    | 22 | 23 | 10  | 23                                              | 10                      | 3.9   | 0.03 | 0.03                      | "         | "       |      |
| 11  | 23           | 0                  | 46   | 57 | 47.1 |                                       | 0  | 48 | 44  | 48                                              | 49                      | 4.1   | 0.02 | 0.02                      | "         | "       |      |
| 12  | 23           | 4                  | 28   | 30 | 28.6 |                                       | 4  | 28 | 58  | 29                                              | 02                      | 3.2   | 0.02 | 0.02                      | "         | "       |      |
| 13  | 24           | 12                 | 26   | 52 | 26   | 52                                    | 12 | 27 | 40  | 27                                              | 42                      | 3.8   | 0.02 | 0.03                      | "         | "       |      |
| 14  | 26           | 15                 | 01   | 39 | ?    |                                       | 15 | 03 | 06  | 03                                              | 07                      | 7.4   | 0.02 | 0.01                      | "         | "       |      |
| 15  | 27           | 9                  | 14.4 |    |      |                                       | 9  | 15 | 19  |                                                 |                         | 3.1   | 0.01 |                           | "         | "       |      |
| 16  | 27           | 23                 | 11   | 42 | 11   | 42                                    | 23 | 11 | 57  | 11                                              | 57                      | 7.2   | 0.73 | 0.75                      | Quick     | "       | Felt |
| 17  | 28           | 6                  | 42.9 |    |      |                                       | 6  | 44 | 53  |                                                 |                         | 4.3   | 0.01 |                           | Slow      | "       |      |
| 18  | 29           | 10                 | 08   | 09 | 08.2 |                                       | 10 | 09 | 04  | 08                                              | 58                      | 5.2   | 0.03 | 0.03                      | "         | "       |      |
| 19  | 29           | 18                 | 29   | 32 | ?    |                                       | 18 | 29 | 45  | 29                                              | 46                      | 1.8   | 0.01 | 0.00                      | "         | "       |      |
| 20  | 31           | 20                 | 20   | 29 | 20   | 30                                    | 20 | 21 | 53  | 21                                              | 53                      | 4.7   | 0.06 | 0.06                      | "         | "       |      |
| 21  | Feb. 2       | 7                  | 02   | 29 |      |                                       | 7  | 03 | 21* |                                                 |                         | 4.0   | 0.04 |                           | "         | "       |      |
| 22  | 2            | 7                  | 31   | 59 |      |                                       | 7  | 33 | 48* |                                                 |                         | 4.8   | 0.02 |                           | "         | "       |      |
| 23  | 3            | 11                 | 29.0 |    | 28.8 |                                       | 11 | 33 | 03  | 32                                              | 49                      | 18.0  | 0.01 | 0.01                      | "         | "       |      |
| 24  | 6            | 5                  | 05   | 29 | 05   | 36                                    | 5  | 07 | 02  | 07                                              | 05                      | 33.2  | 0.04 | 0.06                      | "         | "       |      |
| 25  | 9            | 1                  | 39   | 15 | 39.5 |                                       | 1  | 39 | 38  | ?                                               |                         | 5.5   | 0.01 | 0.02                      | "         | "       |      |
| 26  | 9            | 3                  | 34   | 23 |      |                                       | 3  | 34 | 47  |                                                 |                         | 10.5  | 0.32 |                           | "         | "       |      |
| 27  | 9            | 4                  | 06   | 49 |      |                                       | 4  | 07 | 11  |                                                 |                         | 5.0   | 0.04 |                           | "         | "       |      |
| 28  | 9            | 4                  | 48   | 10 |      |                                       | 4  | 48 | 32  |                                                 |                         | 4.0   | 0.03 |                           | "         | "       |      |
| 29  | 9            | 5                  | 49   | 52 | ?    |                                       | 5  | 51 | 26  | 51                                              | 25                      | 5.6   | 0.01 | 0.01                      | "         | "       |      |
| 30  | 9            | 7                  | 40   | 30 | ?    |                                       | 7  | 42 | 04  | 42                                              | 05                      | 8.6   | 0.02 | ?                         | "         | "       |      |
| 31  | 9            | 8                  | 20.8 |    | ?    |                                       | 8  | 22 | 07  | 22                                              | 08                      | 7.3   | 0.01 | 0.02                      | "         | "       |      |
| 32  | 9            | 10                 | 31   | 23 | 31   | 25                                    | 10 | 31 | 47  | 31                                              | 45                      | 7.6   | 0.10 | 0.16                      | "         | "       |      |
| 33  | 9            | 21                 | 47   | 52 | 47   | 50                                    | 21 | 49 | 32  | 49                                              | 32                      | 23.6  | 0.01 | 0.04                      | "         | "       |      |
| 34  | 9            | 22                 | 18   | 13 | 18.5 |                                       | 22 | 18 | 31  | ?                                               |                         | 2.7   | 0.01 | 0.01                      | "         | "       |      |
| 35  | 10           | 0                  | 26   | 58 | 27   | 08                                    | 0  | 28 | 27  | 28                                              | 33                      | 18.7  | 0.01 | 0.06                      | "         | "       |      |
| 36  | 10           | 1                  | 47.3 |    |      |                                       | 1  | 48 | 35  |                                                 |                         | ?     | ?    |                           | "         | "       |      |
| 37  | 11           | 2                  | 06   | 09 |      |                                       | 2  | 06 | 32  |                                                 |                         | 2.6   | 0.01 |                           | "         | "       |      |
| 38  | 12           | 21                 | 44   | 13 | 44   | 26                                    | 21 | 45 | 52  | 46                                              | 04                      |       | 0.07 | 0.11                      | "         | "       |      |
| 39  | 12           | 21                 | 56   | 34 | ?    |                                       | 21 | 58 | 19  | 58                                              | 20                      | 23.6  | 0.03 | 0.05                      | "         | "       |      |
| 40  | 13           | 5                  | 49   | 46 | 50.1 |                                       | 5  | 51 | 14  | 51                                              | 28                      | 25.5  | 0.05 | 0.05                      | "         | "       |      |
| 41  | 13           | 21                 | 51.4 |    |      |                                       | 21 | 52 | 53  |                                                 |                         | 6.0   | 0.01 |                           | "         | "       |      |
| 42  | 18           | 12                 | 44   | 55 | 44   | 56                                    | 12 | 45 | 32  | 45                                              | 32                      | 8.7   | 0.09 | 0.11                      | "         | "       |      |
| 43  | 19           | 9                  | 35.9 |    | 36.5 |                                       | ?  |    |     | ?                                               |                         | 3.0   | 0.02 | 0.03                      | "         | "       |      |
| 44  | 22           | 4                  | 08   | 50 | 08.9 |                                       | 4  | 10 | 34  | 10                                              | 34                      | 8.3   | 0.04 | 0.04                      | "         | "       |      |
| 45  | 22           | 11                 | 01   | 45 | 01   | 49                                    | 11 | 02 | 18  | 02                                              | 17                      | 7.8   | 0.03 | 0.05                      | "         | "       |      |
| 46  | 22           | 13                 | 19   | 18 | 19.5 |                                       | 13 | 21 | 19  | 21                                              | 18                      | 28.6  | 0.01 | 0.06                      | "         | "       |      |
| 47  | 22           | 14                 | 07   | 24 | ?    |                                       | 14 | 07 | 20  | ?                                               |                         | 8.1   | 0.01 | 0.00                      | "         | "       |      |
| 48  | 22           | 20                 | 00   | 49 | 00.7 |                                       | 20 | 01 | 20  | 01                                              | 20                      | 4.8   | 0.03 | 0.04                      | "         | "       |      |
| 49  | 25           | 10                 | 19   | 02 | ?    |                                       | 10 | 19 | 26  | 19                                              | 25                      | 3.3   | 0.02 | 0.02                      | "         | "       |      |
| 50  | Mar. 4       | 21                 | 04   | 51 | ?    |                                       | 21 | 05 | 36  | 05                                              | 28                      | 3.6   | 0.01 | 0.01                      | "         | "       |      |
| 51  | 7            | 6                  | 13   | 22 | 13.6 |                                       | 6  | 13 | 57  | 14                                              | 00                      | 5.5   | 0.01 | 0.03                      | "         | "       |      |
| 52  | 8            | 4                  | 56   | 35 | 56   | 35                                    | 4  | 56 | 55  | 56                                              | 52                      | 7.0   | 0.26 | 0.35                      | "         | "       |      |
| 53  | 8            | 9                  | 19   | 30 | 19.7 |                                       | 9  | 19 | 52  | ?                                               |                         | 2.2   | 0.01 | 0.01                      | "         | "       |      |
| 54  | 8            | 10                 | 05   | 11 | 05   | 11                                    | 10 | 07 | 11  | 07                                              | 12                      | 5.1   | 0.03 | 0.03                      | "         | "       |      |
| 55  | 11           | 6                  |      |    | 23   | 56                                    | 6  |    |     | 27                                              | 23                      | 6.7   |      | 0.08                      | "         | "       |      |

† Japanese Central Standard Time (9h east from Greenwich), reckoned from midnight.

\* Commence Time of the 2nd preliminary tremor.

## TABLE A.

(Earthquakes)



| No. | Date<br>1919 | Time of Occurrence |    |      |    | Beginning of<br>the Principal portion |    |    |    | Duration<br>of<br>Total<br>Earthquake<br>(mean) | Maximum<br>Range of Motion |     |       | Character<br>of<br>Motion | Intensity | Remarks |        |      |
|-----|--------------|--------------------|----|------|----|---------------------------------------|----|----|----|-------------------------------------------------|----------------------------|-----|-------|---------------------------|-----------|---------|--------|------|
|     |              | E                  | W  | N    | S  | E                                     | W  | N  | S  |                                                 | E                          | W   | N     |                           |           |         | S      |      |
| 56  | Mar.         | 12                 | 19 | 32   | 33 | 32                                    | 32 | 19 | 33 | 26                                              | 33                         | 27  | 10.1  | 0.20                      | 0.31      | Quick   | Feeble | Felt |
| 57  |              | 14                 | 15 | 58   | 53 | ?                                     |    | 15 | 59 | 23                                              | ?                          |     | 3.1   | 0.02                      | 0.01      | Slow    | "      |      |
| 58  |              | 14                 | 23 | 44   | 21 | 44                                    | 17 | 23 | 44 | 54                                              | ?                          |     | 10.9  | 0.01                      | 0.01      | "       | "      |      |
| 59  |              | 16                 | 16 | 39   | 52 | 39                                    | 45 | 16 | 45 | 00*                                             | 45                         | 04* | 41.7  | 0.01                      | 0.03      | "       | "      |      |
| 60  |              | 19                 | 20 | 06   | 44 | ?                                     |    | 20 | 08 | 10                                              | 08                         | 10  | 4.1   | 0.02                      | 0.02      | "       | "      |      |
| 61  |              | 22                 | 2  | 35.0 |    | 35.1                                  |    | ?  |    |                                                 | ?                          |     | 25.2  | 0.02                      | 0.05      | "       | "      |      |
| 62  |              | 23                 | 23 | 10   | 12 | 10                                    | 13 | 23 | 10 | 34                                              | 10                         | 35  | 9.8   | 0.17                      | 0.30      | "       | "      |      |
| 63  |              | 24                 | 6  | 34   | 06 | ?                                     |    | 6  | 34 | 18                                              | 34                         | 18  | 3.7   | 0.03                      | 0.02      | "       | "      |      |
| 64  |              | 26                 | 22 | 37   | 08 | 37                                    | 06 | 22 | 38 | 43                                              | 38                         | 49  | 8.4   | 0.09                      | 0.11      | "       | "      |      |
| 65  |              | 29                 | 5  | 01   | 51 | 01                                    | 53 | 5  | 02 | 05                                              | 02                         | 05  | 2.1   | 0.05                      | 0.03      | "       | "      |      |
| 66  |              | 29                 | 7  | 41   | 02 | 40                                    | 58 | 7  | 41 | 42                                              | 41                         | 42  | 5.4   | 0.05                      | 0.06      | "       | "      |      |
| 67  | Apr.         | 1                  | 3  | 34   | 49 | 34                                    | 51 | 3  | 35 | 06                                              | 35                         | 05  | 4.1   | 0.01                      | 0.07      | "       | "      |      |
| 68  |              | 2                  | 9  | 44   | 36 | 44                                    | 37 | 9  | 52 | 20*                                             | 52                         | 17* | 47.3  | 0.00                      | 0.03      | "       | "      |      |
| 69  |              | 4                  | 22 | 33   | 28 | 33                                    | 28 | 22 | 33 | 39                                              | 33                         | 43  | 10.8  | 0.86                      | 1.07      | Quick   | Weak   | Felt |
| 70  |              | 5                  | 4  | 20   | 28 | 20                                    | 29 | 4  | 20 | 43                                              | 20                         | 44  | 3.6   | 0.03                      | 0.02      | "       | Feeble |      |
| 71  |              | 7                  | 10 | 29   | 13 | 29                                    | 15 | 10 | 29 | 50                                              | 29                         | 48  | 4.9   | 0.02                      | 0.04      | Slow    | "      |      |
| 72  |              | 14                 | 21 | 07   | 47 | ?                                     |    | 21 | 03 | 12                                              | 07                         | 47  | 4.8   | 0.03                      | 0.03      | "       | "      |      |
| 73  |              | 16                 | 8  | 53   | 15 | —                                     | —  | —  | —  | —                                               | —                          | —   | 9.3   | —                         | —         | "       | "      |      |
| 74  |              | 17                 | 20 | 34   | 12 | 34                                    | 13 | 20 | 44 | 11*                                             | 44                         | 07* | 27.7  | 0.02                      | 0.18      | "       | "      |      |
| 75  |              | 18                 | 3  | 47   | 14 | ?                                     |    | 3  | 48 | 29                                              | ?                          |     | 3.9   | 0.01                      | 0.01      | "       | "      |      |
| 76  |              | 26                 | 8  | 01   | 39 | 04                                    | 38 | 8  | 05 | 40                                              | 05                         | 44  | 9.1   | 0.04                      | 0.08      | "       | "      |      |
| 77  |              | 27                 | 2  | 05.6 |    | —                                     | —  | 2  | 06 | 16                                              | —                          | —   | 3.2   | 0.01                      | —         | "       | "      |      |
| 78  |              | 27                 | 4  | 30.4 |    | —                                     | —  | 4  | 30 | 54                                              | —                          | —   | 2.2   | 0.00                      | —         | "       | "      |      |
| 79  |              | 28                 | 12 | 40   | 15 | 40                                    | 23 | 12 | 50 | 31*                                             | 49                         | 42* | 49.7  | 0.02                      | 0.11      | "       | "      |      |
| 80  |              | 30                 | 16 | 28   | 35 | 28                                    | 36 | 16 | 46 | 55                                              | 46                         | 40  | 215.5 | ?                         | ?         | "       | "      |      |
| 81  | May          | 1                  | 14 | 39   | 03 | ?                                     |    | 14 | 39 | 39                                              | 39                         | 36  | 5.3   | 0.05                      | 0.05      | "       | "      |      |
| 82  |              | 2                  | 5  | 51   | 33 | ?                                     |    | 5  | 53 | 00                                              | 53.0                       |     | 3.9   | 0.01                      | ?         | "       | "      |      |
| 83  |              | 3                  | 9  | 52   | 56 | 52                                    | 58 | —  | —  | —                                               | —                          | —   | 192.5 | ?                         | ?         | Quick   | "      | Felt |
| 84  |              | 3                  | 13 | 16.9 |    | —                                     | —  | 13 | 17 | 20                                              | —                          | —   | 1.9   | 0.00                      | —         | Slow    | "      |      |
| 85  |              | 3                  | 15 | 06   | 56 | —                                     | —  | 15 | 07 | 58                                              | —                          | —   | 2.3   | 0.01                      | —         | "       | "      |      |
| 86  |              | 5                  | 1  | 26   | 26 | 26.5                                  |    | 1  | 27 | 08                                              | 27                         | 05  | 3.0   | 0.01                      | 0.01      | "       | "      |      |
| 87  |              | 5                  | 3  | 31   | 50 | 32.7                                  |    | 3  | 32 | 45                                              | ?                          |     | 3.9   | 0.01                      | ?         | "       | "      |      |
| 88  |              | 7                  | 4  | 49   | 25 | 49                                    | 29 | 5  | 00 | 21                                              | 00                         | 21  | 4.4   | ?                         | 7.95      | "       | "      |      |
| 89  |              | 7                  | 12 | 11   | 24 | —                                     | —  | 12 | 11 | 34                                              | —                          | —   | 2.1   | 0.01                      | —         | "       | "      |      |
| 90  |              | 7                  | 14 | 21   | 59 | 22                                    | 05 | 14 | 28 | 27*                                             | 28                         | 54* | 139.4 | 0.00                      | 0.03      | "       | "      |      |
| 91  |              | 8                  | 4  | 38   | 52 | 38                                    | 57 | 4  | 39 | 22                                              | 39                         | 27  | 10.5  | 0.11                      | 0.22      | "       | "      |      |
| 92  |              | 11                 | 0  | 39   | 56 | ?                                     |    | 0  | 41 | 14                                              | 41.2                       |     | 7.8   | 0.01                      | 0.01      | "       | "      |      |
| 93  |              | 12                 | 12 | 59.1 |    | —                                     | —  | 13 | 00 | 26                                              | —                          | —   | 6.6   | 0.01                      | —         | "       | "      |      |
| 94  |              | 15                 | 0  | 58   | 40 | —                                     | —  | 0  | 59 | 23                                              | —                          | —   | 3.4   | 0.01                      | —         | "       | "      |      |
| 95  |              | 16                 | 20 | 46   | 09 | 46.3                                  |    | 20 | 47 | 33                                              | 47                         | 34  | 15.4  | 0.59                      | 0.50      | Quick   | "      | Felt |
| 96  |              | 21                 | 9  | 40   | 55 | 40                                    | 59 | 9  | 42 | 31                                              | 42                         | 32  | 11.4  | 0.03                      | 0.04      | Slow    | "      |      |
| 97  |              | 22                 | 15 | 24.5 |    | ?                                     |    | 15 | 24 | 53                                              | 24                         | 51  | 2.7   | 0.01                      | 0.01      | "       | "      |      |
| 98  |              | 23                 | 21 | 41   | 04 | —                                     | —  | 21 | 41 | 43                                              | —                          | —   | 3.5   | 0.00                      | —         | "       | "      |      |
| 99  |              | 25                 | 4  | 19   | 01 | 19.0                                  |    | 4  | 19 | 37                                              | 19                         | 36  | 4.0   | 0.02                      | 0.02      | "       | "      |      |
| 100 |              | 25                 | 8  | 49   | 23 | —                                     | —  | 8  | 50 | 04                                              | —                          | —   | 3.5   | 0.01                      | —         | "       | "      |      |
| 101 |              | 28                 | 2  | 31   | 45 | —                                     | —  | 2  | 35 | 27*                                             | —                          | —   | 24.8  | 0.00                      | —         | "       | "      |      |
| 102 |              | 28                 | 3  | 31   | 38 | —                                     | —  | 3  | 31 | 47                                              | —                          | —   | 1.2   | 0.01                      | —         | "       | "      |      |
| 103 | June         | 1                  | 1  | 04   | 08 | 05.1                                  |    | 1  | 05 | 24                                              | 06                         | 37  | 12.2  | 0.01                      | 0.01      | "       | "      |      |
| 104 |              | 1                  | 8  | 35   | 00 | 35                                    | 03 | 8  | 35 | 38                                              | 35                         | 45  | 6.8   | 0.05                      | 0.06      | "       | "      |      |
| 105 |              | 1                  | 15 | 55   | 26 | 55                                    | 26 | 15 | 58 | 52                                              | 58                         | 52  | 21.2  | 0.24                      | 0.35      | "       | "      |      |
| 106 |              | 2                  | 7  | 06   | 16 | 06                                    | 21 | 7  | 06 | 36                                              | 06                         | 37  | 3.5   | 0.05                      | 0.05      | "       | "      |      |
| 107 |              | 2                  | 12 | 42   | 52 | 42                                    | 52 | 12 | 43 | 05                                              | 43                         | 05  | 5.7   | 0.11                      | 0.14      | "       | "      |      |
| 108 |              | 3                  | 23 | 25   | 50 | 25                                    | 50 | 23 | 23 | 05                                              | 26                         | 06  | 2.8   | 0.01                      | 0.01      | "       | "      |      |
| 109 |              | 7                  | 18 | 49   | 46 | ?                                     |    | 18 | 50 | 02                                              | 50                         | 01  | 3.9   | 0.01                      | 0.01      | "       | "      |      |
| 110 |              | 7                  | 19 | 17   | 57 | ?                                     |    | 19 | 18 | 18                                              | 18.2                       |     | 3.9   | 0.01                      | 0.01      | "       | "      |      |

\* Commence Time of the 2nd preliminary tremor.

TABLE A.

(Earthquakes)



| No. | Date<br>1919 |    | Time of Occurrence |      |    |      | Beginning of<br>the Principal portion |    |    |     | Duration<br>of<br>Total<br>Earthquakes<br>(mean) | Maximum<br>Range of Motion |      | Character<br>of<br>Motion | Intensity | Remarks |        |      |
|-----|--------------|----|--------------------|------|----|------|---------------------------------------|----|----|-----|--------------------------------------------------|----------------------------|------|---------------------------|-----------|---------|--------|------|
|     |              |    | E                  | W    | N  | S    | E                                     | W  | N  | S   |                                                  | E                          | W    |                           |           |         | N      | S    |
| 111 | June         | 8  | 8                  | 09   | 05 | 09   | 11                                    | 8  | 10 | 20* | 10                                               | 24*                        | 34.6 | 0.01                      | 0.04      | Slow    | Feeble |      |
| 112 |              | 8  | 17                 | 40   | 22 | 40   | 28                                    | 17 | 42 | 02* | 42                                               | 01*                        | 20.2 | 0.00                      | 0.01      | "       | "      |      |
| 113 |              | 9  | 1                  | 36   | 54 | 36.9 |                                       | 1  | 38 | 31* | 38                                               | 33*                        | 13.9 | 0.00                      | 0.00      | "       | "      |      |
| 114 |              | 9  | 7                  | 12   | 30 | —    | —                                     | 7  | 12 | 58  | —                                                | —                          | 6.8  | 0.00                      | —         | "       | "      |      |
| 115 |              | 9  | 8                  | 15   | 38 | 15   | 33                                    | 8  | 16 | 11  | 16                                               | 13                         | 7.2  | 0.01                      | 0.02      | "       | "      |      |
| 116 |              | 9  | 23                 | 17   | 43 | 18.0 |                                       | 23 | 18 | 57* | 19                                               | 02*                        | 38.6 | 0.00                      | ?         | "       | "      |      |
| 117 |              | 10 | 9                  | 46   | 11 | 46   | 12                                    | 9  | 46 | 35  | 46                                               | 41                         | 7.4  | 0.03                      | 0.06      | "       | "      |      |
| 118 |              | 12 | 22                 | 15   | 52 | 15   | 52                                    | 22 | 16 | 27  | 16                                               | 26                         | 5.1  | 0.03                      | 0.04      | "       | "      |      |
| 119 |              | 13 | 0                  | 11   | 44 | ?    |                                       | 0  | 13 | 25  | 13                                               | 24                         | 7.9  | 0.05                      | 0.02      | "       | "      |      |
| 120 |              | 13 | 4                  | 53   | 32 | ?    |                                       | 4  | 55 | 39  | 55.7                                             |                            | 7.7  | 0.02                      | ?         | "       | "      |      |
| 121 |              | 16 | ?                  |      |    | —    | —                                     | 3  | 59 | 06  | —                                                | —                          | ?    | 0.01                      | —         | "       | "      |      |
| 122 |              | 16 | 4                  | 17   | 40 | 17   | 42                                    | 4  | 19 | 40* | 19                                               | 40*                        | 23.6 | 0.00                      | 0.01      | "       | "      |      |
| 123 |              | 18 | 9                  | 21   | 27 | 21   | 26                                    | 9  | 22 | 52* | 22                                               | 52*                        | 17.5 | 0.01                      | ?         | "       | "      |      |
| 124 |              | 18 | 13                 | 24   | 49 | 24.8 |                                       | 13 | 25 | 19  | 25                                               | 26                         | 5.0  | 0.03                      | 0.04      | "       | "      |      |
| 125 |              | 18 | 16                 | 29.9 |    | —    | —                                     | 16 | 30 | 52  | —                                                | —                          | 3.5  | 0.00                      | —         | "       | "      |      |
| 126 |              | 19 | 13                 | 55   | 07 | —    | —                                     | 13 | 56 | 06  | —                                                | —                          | 3.4  | 0.01                      | —         | "       | "      |      |
| 127 |              | 19 | 22                 | 53.7 |    | —    | —                                     | 22 | 54 | 06  | —                                                | —                          | 3.2  | 0.00                      | —         | "       | "      |      |
| 128 |              | 23 | 15                 | 26   | 47 | 26   | 47                                    | 15 | 27 | 16  | 27                                               | 15                         | 13.6 | 0.48                      | 0.45      | Quick   | "      | Felt |
| 129 |              | 24 | 20                 | 11   | 41 | 11.7 |                                       | 20 | 12 | 18  | ?                                                |                            | 8.3  | 0.02                      | 0.02      | Slow    | "      |      |
| 130 |              | 29 | 6                  | 32   | 00 | 32.1 |                                       | 6  | 32 | 31  | 32                                               | 35                         | 6.1  | 0.03                      | 0.02      | "       | "      |      |
| 131 | July         | 2  | 11                 | 02   | 07 | ?    |                                       | 11 | 03 | 49  | 03                                               | 49                         | 7.2  | 0.02                      | 0.02      | "       | "      |      |
| 132 |              | 7  | 12                 | 27   | 34 | —    | —                                     | 12 | 28 | 12  | —                                                | —                          | 3.5  | 0.01                      | —         | "       | "      |      |
| 133 |              | 10 | 1                  | 21   | 28 | 21   | 25                                    | 1  | 22 | 02  | 22                                               | 01                         | 9.9  | 0.14                      | 0.16      | "       | "      |      |
| 134 |              | 10 | 1                  | 48   | 14 | —    | —                                     | 1  | 48 | 52  | —                                                | —                          | 4.5  | 0.00                      | —         | "       | "      |      |
| 135 |              | 12 | 9                  | 15   | 04 | 15   | 03                                    | 9  | 15 | 32  | 15                                               | 37                         | 4.8  | 0.04                      | 0.07      | "       | "      |      |
| 136 |              | 13 | 23                 | 49   | 02 | 49   | 02                                    | 23 | 49 | 15  | 49                                               | 14                         | 5.0  | 0.15                      | 0.20      | "       | "      |      |
| 137 |              | 15 | 14                 | 27   | 26 | 27.6 |                                       | 14 | 28 | 58  | 28                                               | 59                         | 11.5 | 0.08                      | 0.10      | "       | "      |      |
| 138 |              | 16 | 13                 | —    | —  | 11   | 02                                    | 13 | —  | —   | 12                                               | 12                         | 15.3 | —                         | 0.20      | "       | "      |      |
| 139 |              | 16 | 17                 | 58   | 16 | —    | —                                     | 17 | 59 | 59  | —                                                | —                          | 4.3  | 0.01                      | —         | "       | "      |      |
| 140 |              | 17 | 22                 | 08.1 |    | —    | —                                     | 22 | 09 | 43  | —                                                | —                          | 5.6  | 0.01                      | —         | "       | "      |      |
| 141 |              | 18 | 1                  | 11   | 16 | —    | —                                     | 1  | 11 | 28  | —                                                | —                          | 2.0  | 0.00                      | —         | "       | "      |      |
| 142 |              | 18 | 15                 | 54   | 00 | 54.1 |                                       | 15 | 55 | 08  | 55                                               | 08                         | 8.9  | 0.02                      | 0.02      | "       | "      |      |
| 143 |              | 20 | 15                 | 25   | 42 | 25   | 41                                    | 15 | 26 | 00  | 25                                               | 57                         | 8.2  | 0.63                      | 0.61      | Quick   | "      | Felt |
| 144 |              | 22 | 8                  | 50   | 04 | 50   | 04                                    | 8  | 50 | 34  | 50                                               | 32                         | 9.7  | 0.18                      | 0.24      | "       | "      | Felt |
| 145 |              | 23 | 4                  | 38.8 |    | ?    |                                       | 4  | 39 | 09  | 39.1                                             |                            | 3.4  | 0.01                      | ?         | Slow    | "      |      |
| 146 |              | 24 | 4                  | 31   | 12 | 31   | 12                                    | 4  | 31 | 35  | 31                                               | 38                         | 6.2  | 0.03                      | 0.05      | "       | "      |      |
| 147 |              | 26 | 8                  | 00   | 17 | ?    |                                       | 8  | 00 | 42  | ?                                                |                            | 4.6  | 0.01                      | 0.01      | "       | "      |      |
| 148 |              | 26 | 13                 | 16   | 06 | 16.3 |                                       | 13 | 16 | 39  | 16                                               | 52                         | 4.0  | 0.01                      | 0.01      | "       | "      |      |
| 149 |              | 26 | 14                 | 43   | 51 | —    | —                                     | 14 | 44 | 02  | —                                                | —                          | 2.1  | 0.01                      | —         | "       | "      |      |
| 150 |              | 26 | 18                 | 19   | 01 | ?    |                                       | 18 | 20 | 33  | 20.6                                             |                            | 6.6  | 0.01                      | 0.01      | "       | "      |      |
| 151 |              | 26 | 22                 | 49   | 11 | 49   | 15                                    | 22 | 50 | 33  | 50                                               | 38                         | 7.0  | 0.02                      | 0.02      | "       | "      |      |
| 152 |              | 28 | 3                  | 19   | 18 | —    | —                                     | 3  | 19 | 29  | —                                                | —                          | 1.0  | 0.00                      | —         | "       | "      |      |
| 153 |              | 28 | 6                  | 50.8 |    | —    | —                                     | 6  | 51 | 32  | —                                                | —                          | 2.9  | 0.01                      | —         | "       | "      |      |
| 154 | Aug.         | 4  | 3                  | 10   | 00 | 10   | 00                                    | 3  | 11 | 07  | 11                                               | 03                         | 25.0 | 1.27                      | 0.66      | "       | "      |      |
| 155 |              | 4  | 5                  | 27.9 |    | —    | —                                     | 5  | 29 | 12  | —                                                | —                          | 5.8  | 0.01                      | —         | "       | "      |      |
| 156 |              | 4  | 5                  | 54   | 15 | 54   | 19                                    | 5  | 55 | 16  | 55                                               | 20                         | 11.1 | 0.12                      | 0.20      | "       | "      |      |
| 157 |              | 4  | 6                  | 17.2 |    | ?    |                                       | 6  | 18 | 01  | 18.0                                             |                            | 5.8  | 0.01                      | 0.01      | "       | "      |      |
| 158 |              | 8  | 1                  | 23   | 22 | 23.7 |                                       | 1  | 24 | 01  | ?                                                |                            | 6.2  | 0.02                      | 0.03      | "       | "      |      |
| 159 |              | 8  | 1                  | 32   | 21 | 32   | 21                                    | 1  | 33 | 05  | 33                                               | 01                         | ?    | 0.69                      | 0.80      | "       | "      |      |
| 160 |              | 8  | 1                  | 46   | 37 | —    | —                                     | ?  | —  | —   | —                                                | —                          | 6.1  | 0.02                      | —         | "       | "      |      |
| 161 |              | 9  | 21                 | 56   | 19 | 56   | 20                                    | 21 | 57 | 11  | 57                                               | 11                         | 6.3  | 0.10                      | 0.11      | "       | "      |      |
| 162 |              | 13 | 7                  | 48   | 47 | ?    |                                       | 7  | 49 | 03  | ?                                                |                            | 3.0  | 0.01                      | 0.01      | "       | "      |      |
| 163 |              | 15 | 11                 | 07.5 |    | —    | —                                     | ?  | —  | —   | —                                                | —                          | ?    | ?                         | —         | "       | "      |      |
| 164 |              | 16 | 2                  | 12   | 43 | ?    |                                       | 2  | 12 | 51  | ?                                                |                            | 1.7  | 0.06                      | 0.03      | Quick   | "      | Felt |
| 165 |              | 17 | 4                  | 21   | 41 | 21   | 41                                    | 4  | 22 | 20  | 22                                               | 17                         | 5.2  | 0.05                      | 0.07      | Slow    | "      |      |

\* Commence Time of the 2nd preliminary tremor.

TABLE A.

(Earthquakes)



| No. | Date<br>1919 | Time of Occurrence |    |      |    | Beginning of<br>the Principal portion |    |    |      | Duration<br>of<br>Total<br>Earthquake<br>(mean) | Maximum<br>Range of Motion |      | Character<br>of<br>Motion | Intensity | Remarks |       |   |      |
|-----|--------------|--------------------|----|------|----|---------------------------------------|----|----|------|-------------------------------------------------|----------------------------|------|---------------------------|-----------|---------|-------|---|------|
|     |              | E                  | W  | N    | S  | E                                     | W  | N  | S    |                                                 | E                          | W    |                           |           |         | N     | S |      |
| 166 | Aug.         | 13                 | 3  | 04   | 00 | 04.0                                  | 3  | 04 | 32   | ?                                               | 4.6                        | 0.02 | 0.03                      | Slow      | Feeble  |       |   |      |
| 167 |              | 19                 | 2  | 06   | 08 | 06                                    | 09 | 2  | 14   | 47*                                             | 14                         | 54*  | 42.3                      | ?         | 0.04    | "     | " |      |
| 168 |              | 24                 | 14 | 12   | 19 | 12.4                                  |    | 14 | 13   | 25                                              | 13                         | 26   | 6.4                       | 0.03      | 0.05    | "     | " |      |
| 169 |              | 27                 | 14 | 25   | 42 | 25                                    | 41 | 14 | 29   | 09*                                             | 29                         | 13*  | 40.5                      | 0.02      | 0.09    | "     | " |      |
| 170 |              | 29                 | 14 | 52   | 05 | 52                                    | 05 | 15 | 58   | 38*                                             | 58                         | 36*  | 53.9                      | 0.11      | 0.53    | "     | " |      |
| 171 | Sept.        | 1                  | 2  | 30   | 35 | 30                                    | 36 | 2  | 45   | 28                                              | 45                         | 24   | 47.5                      | 0.02      | 0.09    | "     | " |      |
| 172 |              | 2                  | 1  | 11.2 |    | ?                                     |    | 1  | 12.2 |                                                 | ?                          |      | 7.0                       | 0.03      | 0.03    | "     | " |      |
| 173 |              | 3                  | 3  | 58   | 04 | —                                     | —  | 3  | 58   | 20                                              | —                          | —    | 2.9                       | 0.01      | —       | "     | " |      |
| 174 |              | 4                  | 2  | 28   | 19 | 28.5                                  |    | 2  | 30   | 13                                              | ?                          |      | 11.2                      | 0.04      | 0.03    | "     | " |      |
| 175 |              | 5                  | 17 | 54.4 |    | ?                                     |    | 17 | 54   | 39                                              | 54                         | 39   | 2.3                       | 0.02      | 0.04    | "     | " |      |
| 176 |              | 8                  | 17 | 40   | 25 | ?                                     |    | 17 | 42   | 32                                              | 42                         | 31   | 8.4                       | 0.06      | 0.02    | "     | " |      |
| 177 |              | 10                 | 2  | 18   | 57 | 19                                    | 14 | 2  | 19   | 28                                              | 19                         | 40   | 5.4                       | 0.05      | 0.06    | "     | " |      |
| 178 |              | 11                 | 14 | —    | —  | 35                                    | 10 | 14 | —    | —                                               | 38                         | 11   | 6.8                       | —         | 0.03    | "     | " |      |
| 179 |              | 12                 | 22 | 51   | 45 | 51                                    | 51 | 22 | 53   | 28                                              | 53                         | 31   | 28.0                      | 0.07      | 0.16    | "     | " |      |
| 180 |              | 12                 | 23 | 53   | 30 | 53                                    | 30 | 23 | 54   | 08                                              | 54                         | 07   | 15.3                      | 0.17      | 0.35    | Quick | " | Felt |
| 181 |              | 13                 | 14 | 14.1 |    | 14.6                                  |    | ?  |      |                                                 | ?                          |      | 3.4                       | 0.01      | 0.01    | Slow  | " | "    |
| 182 |              | 13                 | 14 | 43.9 |    | —                                     | —  | ?  |      |                                                 | —                          | —    | 2.9                       | 0.01      | —       | "     | " | "    |
| 183 |              | 13                 | 22 | 15   | 08 | 15.4                                  |    | 22 | 19   | 34                                              | 19                         | 29   | 8.0                       | 0.02      | 0.01    | "     | " | "    |
| 184 |              | 15                 | 15 | 10   | 48 | 10.7                                  |    | 15 | 12   | 35                                              | 12                         | 35   | 6.2                       | 0.07      | 0.11    | "     | " | "    |
| 185 |              | 17                 | 21 | 30   | 18 | 30                                    | 17 | 21 | 30   | 29                                              | 30                         | 28   | 6.4                       | 0.27      | 0.26    | Quick | " | Felt |
| 186 |              | 17                 | 22 | 12   | 16 | 12                                    | 15 | 22 | 12   | 57                                              | 12                         | 57   | 6.7                       | 0.08      | 0.10    | "     | " | "    |
| 187 |              | 22                 | 18 | 24   | 36 | 24                                    | 36 | 18 | 24   | 50                                              | 24                         | 51   | 6.8                       | 0.18      | 0.20    | "     | " | Felt |
| 188 |              | 26                 | 16 | 29.0 |    | 29.5                                  |    | ?  |      |                                                 | ?                          |      | 3.3                       | 0.01      | 0.02    | Slow  | " | "    |
| 189 |              | 26                 | 18 | 12   | 46 | 12                                    | 42 | 18 | 17   | 31*                                             | 17                         | 28*  | 22.4                      | ?         | 0.03    | "     | " | "    |
| 190 |              | 27                 | 4  | 46   | 35 | 46                                    | 39 | 4  | 52   | 06*                                             | 52                         | 12*  | 52.4                      | 0.01      | 0.12    | "     | " | "    |
| 191 |              | 28                 | 13 | 39   | 44 | 40.1                                  |    | 13 | 40   | 18                                              | ?                          |      | 4.0                       | 0.01      | 0.01    | "     | " | "    |
| 192 |              | 28                 | 16 | 33   | 39 | 33                                    | 37 | 16 | 33   | 51                                              | 33                         | 49   | 9.8                       | 0.48      | 0.51    | Quick | " | Felt |
| 193 |              | 29                 | 23 | 00   | 00 | 00.0                                  |    | 23 | 00   | 36                                              | ?                          |      | 5.2                       | 0.01      | 0.01    | "     | " | "    |
| 194 |              | 30                 | 4  | 36   | 04 | 37.2                                  |    | 4  | 37   | 13                                              | ?                          |      | 15.3                      | 0.01      | ?       | Slow  | " | "    |
| 195 | Oct.         | 11                 | 8  | 52   | 27 | —                                     | —  | 8  | 52   | 37                                              | —                          | —    | 1.4                       | 0.01      | —       | "     | " | "    |
| 196 |              | 11                 | 22 | 18   | 08 | 18                                    | 08 | 22 | 18   | 37                                              | 18                         | 34   | 20.4                      | 1.45      | 2.40    | Quick | " | Felt |
| 197 |              | 13                 | 6  | 58   | 07 | 58                                    | 07 | 7  | 05   | 56*                                             | 05                         | 54*  | 103.2                     | 0.01      | 0.02    | Slow  | " | "    |
| 198 |              | 14                 | 15 | 38   | 27 | 38.5                                  |    | 15 | 38   | 55                                              | 39                         | 04   | 5.4                       | 0.04      | 0.05    | "     | " | "    |
| 199 |              | 21                 | 12 | 03   | 03 | 03                                    | 04 | 12 | 03   | 18                                              | 03                         | 18   | 3.8                       | 0.07      | 0.05    | Quick | " | Felt |
| 200 |              | 31                 | 23 | 19   | 21 | ?                                     |    | 23 | 19   | 37                                              | 18                         | 54   | 5.0                       | 0.03      | 0.03    | "     | " | "    |
| 201 | Nov.         | 1                  | 2  | 27   | 04 | 27.9                                  |    | 2  | 27   | 20                                              | ?                          |      | 2.4                       | 0.02      | ?       | "     | " | "    |
| 202 |              | 5                  | 0  | 53   | 21 | 53                                    | 22 | 0  | 54   | 02                                              | 54                         | 04   | 5.1                       | 0.01      | 0.04    | Slow  | " | "    |
| 203 |              | 6                  | 10 | 41   | 20 | —                                     | —  | 10 | 41   | 41                                              | —                          | —    | 2.4                       | 0.01      | —       | "     | " | "    |
| 204 |              | 6                  | 15 | 12.6 |    | —                                     | —  | ?  |      |                                                 | —                          | —    | 2.2                       | ?         | —       | "     | " | "    |
| 205 |              | 6                  | 22 | 50   | 03 | 50                                    | 03 | 22 | 51   | 47                                              | 51                         | 48   | 4.8                       | 0.02      | 0.03    | "     | " | "    |
| 206 |              | 12                 | 20 | 15   | 29 | ?                                     |    | 20 | 16   | 40                                              | 16                         | 39   | 4.0                       | 0.01      | 0.02    | "     | " | "    |
| 207 |              | 12                 | 23 | 20   | 42 | 20                                    | 40 | 23 | 21   | 48                                              | 22                         | 07   | 8.1                       | 0.05      | 0.05    | "     | " | "    |
| 208 |              | 13                 | 1  | 51   | 06 | 51                                    | 07 | 1  | 52   | 37                                              | 52                         | 37   | 9.1                       | 0.02      | 0.02    | "     | " | "    |
| 209 |              | 18                 | 13 | 07   | 05 | 07                                    | 12 | 13 | 13   | 45*                                             | 13                         | 45*  | ?                         | ?         | 0.03    | "     | " | "    |
| 210 |              | 20                 | 23 | 21   | 06 | 21                                    | 07 | 23 | 29   | 05*                                             | 28                         | 45*  | 35.9                      | 0.02      | 0.03    | "     | " | "    |
| 211 |              | 24                 | 5  | 05   | 14 | 05                                    | 14 | 5  | 05   | 25                                              | 05                         | 24   | 2.3                       | 0.03      | 0.03    | "     | " | "    |
| 212 | Dec.         | 4                  | 15 | 26.6 |    | 26.6                                  |    | ?  |      |                                                 | —                          | —    | 1.8                       | 0.01      | —       | "     | " | "    |
| 213 |              | 9                  | 13 | 22   | 20 | 22.3                                  |    | 13 | 22   | 34                                              | 22                         | 34   | 2.4                       | 0.05      | 0.05    | "     | " | "    |
| 214 |              | 11                 | 15 | 41   | 16 | 41                                    | 17 | 15 | 41   | 40                                              | ?                          |      | 4.4                       | 0.09      | 0.10    | "     | " | "    |
| 215 |              | 15                 | 17 | 16   | 10 | ?                                     |    | 17 | 17   | 52                                              | 17                         | 49   | 5.4                       | 0.02      | 0.03    | "     | " | "    |
| 216 |              | 18                 | 5  | 11   | 10 | —                                     | —  | 5  | 11   | 24                                              | —                          | —    | 1.1                       | 0.01      | —       | "     | " | "    |
| 217 |              | 20                 | 9  | 28   | 35 | 28                                    | 35 | 9  | 29   | 03                                              | 29                         | 02   | 16.4                      | 0.91      | 1.25    | Quick | " | Felt |
| 218 |              | 21                 | 4  | 39   | 12 | 39                                    | 10 | 4  | 43   | 22                                              | 43                         | 20   | 31.6                      | 0.15      | ?       | Slow  | " | "    |
| 219 |              | 21                 | 5  | 42   | 40 | 42                                    | 40 | 5  | 46   | 48                                              | 46                         | 39   | 42.2                      | 0.35      | 1.28    | "     | " | "    |
| 220 |              | 21                 | 6  | 44.4 |    | 44.3                                  |    | ?  |      |                                                 | ?                          |      | 13.4                      | 0.01      | 0.10    | "     | " | "    |

\* Commence Time of the 2nd preliminary tremor.



TABLE B.

(Pulsatory Oscillations EW Component.)

| Beginning    |      | Ending       |           | Maximum      |      |                     |       |       |       |
|--------------|------|--------------|-----------|--------------|------|---------------------|-------|-------|-------|
| Date<br>1919 | Hour | Date<br>1919 | Hour      | Date<br>1919 | Hour | Double<br>Amplitude |       |       |       |
|              | h    |              | h         |              | h h  | m m                 |       |       |       |
| January      | 1    | 13           | January   | 6            | 1    | January             | 2     | 4-7   | 0.02  |
|              | 12   | 0            |           | 18           | 9    |                     | 4     | 23-24 | 0.01  |
|              | 19   | 12           |           | 24           | 12   |                     | 12    | 14-16 | 0.01  |
| February     | 3    | 19           | February  | 6            | 17   | February            | 5     | 4-7   | 0.02  |
|              |      |              |           |              |      |                     |       | 20    | 13-15 |
|              | 7    | 7            |           | 9            | 18   |                     | 8     | 1-2   | 0.01  |
|              | 10   | 9            |           | 13           | 16   |                     | 10    | 20-23 | 0.01  |
|              | 14   | 10           |           | 16           | 15   |                     | 12    | 9-13  | 0.01  |
|              | 18   | 15           |           | 20           | 23   |                     | 15    | 2-8   | 0.01  |
|              |      |              |           |              |      |                     | 19    | 14-15 | 0.01  |
| March        | 22   | 13           | March     | 28           | 3    | March               | 23    | 10-15 | 0.02  |
|              | 1    | 9            |           | 6            | 1    |                     | 2     | 13-15 | 0.01  |
|              | 7    | 3            |           | 8            | 18   |                     | 7     | 16-18 | 0.01  |
|              | 9    | 9            |           | 10           | 21   |                     | 10    | 8-11  | 0.02  |
|              | 12   | 6            |           | 19           | 2    |                     | 13    | 22-23 | 0.01  |
|              |      |              |           |              |      | 18                  | 9-11  | 0.01  |       |
|              | 20   | 8            |           | 23           | 2    |                     | 20    | 21-23 | 0.01  |
|              | 25   | 9            |           | 27           | 12   |                     | 22    | 9-13  | 0.01  |
| April        | 28   | 14           | April     | 30           | 3    | April               | 26    | 11-14 | 0.02  |
|              | 8    | 8            |           | 10           | 4    |                     | 28-29 | 22-3  | 0.02  |
|              |      |              |           |              |      |                     | 8     | 14-16 | 0.01  |
|              | 10   | 10           |           | 13           | 21   |                     | 12    | 17-20 | 0.01  |
|              | 15   | 7            |           | 16           | 23   |                     | 16    | 6-9   | 0.01  |
|              | 19   | 13           |           | 22           | 6    |                     | 20    | 6-11  | 0.01  |
|              | 22   | 13           |           | 24           | 8    |                     | 23    | 7-9   | 0.01  |
|              | 27   | 3            |           | 29           | 19   |                     | 27    | 9-10  | 0.02  |
| May          | 3    | 10           | May       | 5            | 8    | May                 | 4     | 4-8   | 0.03  |
|              | 11   | 7            |           | 12           | 20   |                     | 12    | 6-7   | 0.01  |
| June         | 13   | 9            | June      | 14           | 23   | June                | 14    | 6-9   | 0.01  |
|              | 5    | 16           |           | 6            | 18   |                     | 6     | 6-7   | 0.01  |
|              | 10   | 22           |           | 12           | 23   |                     | 11    | 20-22 | 0.01  |
| August       | 22   | 13           | August    | 24           | 18   | August              | 23    | 2-4   | 0.01  |
|              | 5    | 2            |           | 7            | 6    |                     | 6     | 1-6   | 0.03  |
|              | 14   | 11           |           | 18           | 22   |                     | 15    | 15-17 | 0.02  |
| September    | 12   | 7            | September | 17           | 18   | September           | 15    | 7-9   | 0.01  |
|              | 19   | 20           |           | 23           | 19   |                     | 21    | 14-16 | 0.01  |
|              | 25   | 10           |           | 26           | 23   |                     | 26    | 4-5   | 0.01  |
| October      | 1    | 8            | October   | 10           | 18   | October             | 5     | 16-17 | 0.02  |
|              | 22   | 2            |           | 22           | 10   |                     | 6     | 14-16 | 0.02  |
| November     | 5    | 2            | November  | 6            | 23   | November            | 22    | 7-8   | 0.01  |
|              |      |              |           |              |      |                     |       | 5     | 16-18 |
|              | 9    | 6            |           | 9            | 23   |                     | 9     | 16-17 | 0.01  |
|              | 14   | 13           |           | 17           | 1    |                     | 15    | 17-18 | 0.01  |
|              | 17   | 9            |           | 21           | 17   |                     | 19    | 5-9   | 0.02  |
| December     | 24   | 13           | December  | 26           | 1    | December            | 25    | 3-4   | 0.01  |
|              | 1    | 8            |           | 2            | 23   |                     | 1     | 13-14 | 0.01  |
|              | 7    | 2            |           | 12           | 15   |                     | 9     | 16-17 | 0.01  |
|              | 16   | 6            |           | 18           | 19   |                     | 11    | 1-3   | 0.01  |
|              | 25   | 7            |           | 28           | 6    |                     | 16-17 | 23-1  | 0.02  |
|              | 28   | 18           |           | 31           | 10   |                     | 26    | 6-9   | 0.02  |
|              |      |              |           |              |      |                     | 29    | 16-21 | 0.04  |