Newkirk

Attachment to
HAO Misc. Reprint No. 50

25 August 1956

HIGH ALTITUDE OBSERVATORY
of the
University of Colorado

Solar Research Memorandum No. 78

FROM: S. Matsushita

SUBJECT: Recent Auroras Seen in Japan

In my report entitled "Ancient Aurorae Seen in Japan" (Journal of Geophysical Research, 61, 297, 1956), I did not deal with auroral data after 1910, because the situation in Japan changed a great deal following that year. After 1910, meteorological stations were well distributed all over Japan, even in her northernmost island, Sakhalin, which became a Japanese territory in 1905.

Several auroras have been seen since 1910 in the northern part of Japan, as shown in Table 1.

The observations of these listed auroras are reliable: the auroras coincided with notable magnetic storms, occurring near sunspot maximum; in the column "Year of Sunspot Maximum" the epoch relative for the nearest sunspot maximum is given in years.

Most recently, Dr. I. Yamamoto, a Japanese astronomer, reported that he saw an aurora at OTSU (gm 24.5°N) near KYOTO from about 3.5 h. to 4 h. in 135°EMT on the 9th of August 1956 (18 h. - 18.5 h. on the 8th in GMT). If this is true, it may be very interesting, because aurora has not been seen at that latitude of Japan since 1775. However, this is rather doubtful, because no others saw that particular aurora, and also the time at which the aurora appeared was about 17 hours before the occurrence of a sudden commencement of a small magnetic storm.

APPENDIX

Ancient Auroras Seen in Korea

Nishioka's book (see reference) gives a list compiled by T. Taguchi of 204 auroras seen from Korea (gm 24°N - 33°N), although it does not show the name of observing places in Korea. (See Table 2.) The

auroral information provided does not permit the assessment of the reliability of these observations: the list may include many doubtful and unlikely cases.

The total number of listed auroras in four seasons of the year for different phases of sunspot cycle is given in the following table.

Phase of sunspot cycle	Nov.-Jan.	Feb.-April	May-July	Aug.-Oct.	Lack of a month	Total
Within 3 years before maximum	9	28	7	9	4	57
Maximum year	8	11	2	4	2	27
Within 3 years after maximum	16	40	3	12	5	76
The others	5	28	3	7	1	44
Total	38	107	15	32	12	204

Table 3

It may be noticed in the table that a large number of listed auroras were observed near the sunspot maximums. However, one question is why almost all of these auroras were not seen in Japan. Another question is why observations for Aug.-Oct. were not comparable in number to those for Feb.-April.

In conclusion, the author wishes to express his sincere gratitude to Dr. S. Chapman for suggesting this study and for helpful discussions. This work was supported by the Geophysics Research Directorate, Air Force Cambridge Research Center, under contract AF19(604)-969.

REFERENCES

Chapman, S. 1956, "The Aurora in Middle and Low Latitudes," IGY Auroral Manual.

Fritz, H. 1873, Verzeichniss Beobachteter Polarlichter, Wien, Akademie.

Hatakeyama, H., TENKI TO KIKO (Weather and Climate), 5, 233 (1938); 6, 16 (1939).

Kanda, S. 1947, NIPPON TENMON KISHO SHIRYO (Historical Data on Meteorology and Astronomy in Japan).

KYOKUKO HOKOKU (Report on Auroras Seen on the 22nd and the 26th of Jan. 1938), The Observatory in Sakhalin, 1939.

Nishioka, H. 1956, KANDAN NO REKISHI (History of Climatic Change).

Schove, D.J. 1955, J.G.R., 60, 127.

Sunspot and Geomagnetic-Storm Data Derived from Greenwich Observations 1874-1954, London: Her Majesty's Stationery Office, 1955.

End of Memo

kml

Tables 1 and 2 are attached.

	Date and time in 135°EMT and GMT	Places and special details	Range (in γ) of H-component during geomagnetic storm GREENWICH (gm 54°N)	KAKIOKA (gm 26°N)	Year of sun-spot maximum
1.	1928, Oct. 18	SAPPORO (43°N, 141°E; gm 33°N)	260		1928.4 (+0.4)
2.	1938, Jan. 22 18.5 h. - 20.5 h. EMT; 9 h. - 11 h. GMT	Many places in HOKKAIDO, SAKHALIN, SIBERIA and CHISHIMA IS. Red and yellow color, sometimes with yellow rays. Southernmost observed place was MIYAKO (40°N, 142°E; gm 30°N)	725	491	1937.4 (+0.7)
3.	1938, Jan. 26 2.5 h. - 5.5 h. EMT; 25th 17 h. - 20 h. GMT	Several places higher than gm 37°N. Red and yellow with rays.	1055	355	1937.4 (+0.7)
4.	1940, Mar. 31	RISHIRI (45°N, 141°E; gm 35°N)	620		1937.4 (+2.9)
5.	1941, Mar. 1	ANBETSU (50°N, 142°E; gm 40°N)	1650		1937.4 (+3.9)

Table 1

gm is geomagnetic latitude.
+ means after the maximum.

(More details for Nos. 1, 4 and 5 will be supplied in the future.)

1012, June 18
−*1014, April 12
+*1017, Feb. 2
+*1017, Mar. 10
+*1018, Jan. 20

+*1028, Oct. 1
1073, Jan. 19
*1088, Aug. 20
+*1101, Feb. 6
1104, Feb. 13, 27

1105, Mar. 3
−*1108, Feb. 5
−*1109, May 19
+*1113, Mar. 18
1114, April 9

−*1115, Mar. 28
−*1116, Oct. 17, 24
−*1117, Mar. 3
+*1121, Mar. 2
+*1121, April 21

1123, Mar. 28
−*1126, July 6
−*1126, Aug. 11
−*1127, Oct. 24
−*1128, Mar. 6

−*1128, July 31
−*1128, Oct. 27
−*1128, Dec. 20
*1129, Jan. 17
*1129, Nov. 1

+*1130, April 7
+*1130, June 26
+*1130, Oct. 6 F(1)
+*1131, Mar. 3, 8
−*1137, Feb. 24

*1138, Sept. 4, 10
*1138, Oct. 13
*1138, Dec. 9
+*1141, Aug. 30
+*1141, Nov. 29

+*1141, Dec. 30
1156, May 2
*1173, Feb. 2
+*1175, Nov. 20
+*1176, Mar. 20, 21, 26

+*1176, Sept. 20
+*1176, Oct. 17
1177, Feb. 26
1177, Mar. 30
1177, Aug. 9

1178, Jan. 4
1178, April 14
1179, April 12
1181, Mar. 20
1181, Sept. 11

*1185, April 2
+*1187, Oct. 8
+*1187, Nov. 15, 19
+*1188, —
*1193, Jan. 6

+*1195, April 15
+*1196, Nov. 16
−*1201, --
−*1217, April 19, 25
+*1220, Mar. 20

+*1221, Sept. 19
+*1222, May 10
+*1222, —
+*1222, Sept. 8
−*1225, Aug. 23

−*1226, --
−*1227, April 11
−*1227, Sept. 3
*1228, April 6
+*1229, Sept. 16

*1249, Mar. 24
+*1250, --
+*1252, Jan. 9
1253, April 26
1253, Sept. 5

1255, Sept. 28
1255, Oct. 9
−*1256, June 4
−*1257, Mar. 21
−*1257, July 2

−*1258, --
*1259, Feb. 2
*1259, July 24
+*1260, Aug. 14
+*1260, Nov. 6

+*1260, —
+*1262, Nov. 16
+*1262, Dec. 15
1264, Feb. 23
1268, Dec. 27

−*1274, Feb. 2
−*1275, Jan. 28
*1276, Dec. 9
+*1277, April 6
+*1277, May 6

+*1278, Mar. 30
+*1278, April 2
1282, Feb. 17
−*1287, April 14
*1288, Nov. 20

−*1293, Jan. 8
−*1294, Feb. 8
*1296, Feb. 11
*1296, May 6
−*1307, April 4

−*1314, Mar. 17
*1316, April 1
*1316, --
+*1317, Feb. 19
1320, Feb. 9

−*1321, Feb. 7
−*1321, April 20
*1324, Mar. 29
*1324, April 28
1329, June 8

1358, April 19
−*1361, Feb. 18 F(2)
+*1364, Mar. 5, 9
+*1365, Mar. 22, 25, 26, 27
1366, Dec. 9

1367, Feb. 15, 26
1367, Mar. 9, 12, 14
1367, April 2
1368, Feb. 29
1368, Mar. 18, 27

−*1369, Dec. 23
−*1370, Mar. 25
−*1371, —
−*1371, Oct. 28
*1372, April 21

+*1373, Jan. 20
+*1373, Feb. 5, 10, 25
+*1373, Mar. 6, 11
+*1373, April 19
+*1373, Aug. 16

+*1374, Mar. 15, 18
+*1374, April 21, 22
1377, Oct. 19
−*1379, Feb. 17
−*1379, Mar. 24, 31

−*1380, April 11
−*1381, Jan. 22
−*1381, Feb. 8
−*1381, Mar. 7
+*1384, Jan. 6

+*1385, Mar. 15
−*1390, Mar. 19
*1391, Feb. 14
+*1393, Mar. 16, 20, 26
+*1393, —

1398, Oct. 10
−*1400, Dec. 17
−*1401, Feb. 14
−*1411, Jan. 3
+*1520, April 20

1552, Nov. 9
1566, April 6
*1591, —
+*1594, Jan. 2
1597, Feb. 18

1600, —
−*1601, Dec. 4
+*1606, Jan. 30
1622, Mar. 14
−*1623, Mar. 28 F(3)

−*1624, Jan. 27
−*1624, June 9 F(4)
*1626, Jan. 16
+*1628, April 5
+*1629, Nov. 14

1633, Feb. 10
−*1636, Aug. 28
−*1638, July 16
+*1650, Aug. 2
*1675, Jan. 31

Table 2

The symbols +* or −* in the list signify that the aurora occurred within three years after or three years before the nearest sunspot maximum, and the symbol * signifies that it occurred in sunspot maximum year, as listed by D.J. Schove.

Auroras observed elsewhere at approximately the same date (after H. Fritz): F(1) Böhme, 1130, Oct. 7; F(2) Constance (Bodensee), 1361, Feb. 15; F(3) Zürich and some other places, 1623, Mar. 29; F(4) Utrecht, 1624, June 7.