Recovery of early 19th century meteorological observations in Japan

G. P. Können* ,M.Zaiki ** and T. Mikami**

*Royal Netherlands Meteorological Institute (KNMI), PO Box 201, 3730AE de Biit, Netherlands; **Tokyo Metropolitan University, Department of Geography, Minami-Ohsawa 1-1, Hachioji-shi, Tokyo 192-0397, Japan.

Abstract
From the 17th century onward until 1868, visual daily weather reports are recorded in diaries at many places in Japan. The official meteorological observations in Japan started in 1872. We recovered instrumental observations in Dejima (Nagasaki), taken under the responsibility of the Dutch, covering the periods 1845-1858 and 1871-1883. The Dejima series overlaps both with the Nagasaki Observatory series 1878-present and with the Nagasaki 1700-1868 documentary series. The recovered data provides a means for calibrating the documentary series. Together with a recovered 1819-1830 temperature series of Dejima, it also pushes the start of the instrumental Nagasaki series back from 1878 to 1819, leaving major gaps for 1831-1844 and 1859-1870.

Introduction

The official meteorological network of Japan was founded in the 1870-ies. Prior to that time, visual weather reports on a daily basis were taken at many places in Japan and preserved in diaries. These observations extend back to the 17th century and are digitized by one of us [1]. The routine of keeping the records ended in 1868. Hence there is no overlap with the instrumental records.

In the 1830-ies, the Dutch authorities decided to start systematic meteorological observations in their trade settlements overseas, including the settlement in Dejima. The elements included temperature, wind, cloud cover, humidity, pressure and precipitation. Officially calibrated instruments were used. The observations, basically four times a day, were taken under responsibility of the medical officer. In Dejima, the practice started in 1845. The lists were annually sent to the Netherlands; a copy was kept at the station. We made an attempt to recover these series.

Results

We found Dejima observations 1845-1856 printed in the 19th century KNMI Yearbooks [2] having a 12-month gap in 1852-53. The original observation list of this 12-month gap was accidentally recovered in an unofficial archive in the Rotterdam harbor. Additionally, a small book [3] with the 1858 observations was found in the KNMI archive. Despite of our efforts, the original lists of the printed observations could not be located so far. The lists of the 1857, 1859-1864 observations, in which years observations were taken and sent to the Netherlands and then to KNMI [4] but not published, could also not be found.

An extended search in the KNMI archives revealed the existence of a series taken in the Nagasaki Dutch Hospital, which was located closely to the present meteorological observatory. It contains basically the same elements as the Dejima series; the observations are three times a day. For 1871-1877 the observations appeared in print [5]; for 1878-1880 daily temperature, pressure and rainfall data are also available and supplemented by monthly summaries for 1878-1883 [6]. As the Nagasaki Observatory started in July 1878, there is an overlap of six years between the Nagasaki Hospital series and the Nagasaki Observatory series.

Additionally, a search in the Nagasaki library yielded a temperature series 1819-1830, three times a day, taken by the Dejima medical officer von Siebold. The existence of that series has never been hinted at in the station history of Dejima.

TABLE 1
Dejima/Nagasaki Hospital, observers in charge

Dejima, early observations	1819-1830	Von Siebold
Dejima, 1845-1858+	1845-1855	Mönicke
	1855-1857	Van den Broek
	1857-1864(?)	Pompe van Meerdervoort
Nagasaki Hospital, 1871-1883	1871-1874	Geerts
	1875-1877+	Van Leeuwen van Duyvenbode

Table 1 lists the names of the observers in charge and Table 2 summarizes the contents of the recovered series. Note that precipitation is only available from 1852, and that temperature, humidity and pressure of the four observation hours are for 1845-1849 only published as 10-day averages. The background documents state however that the readings were fully taken daily in those years. This emphasizes the need to recover the original lists.

TABLE 2
Dejima/Nagasaki Hospital observations 1819-1883

1819-1830	temperature
1845-1855	temperature, humidity (till 1852), pressure (gap 1849-1851), precipitation (from 1852), cloudcover, winddirection and speed
1856	temperature, pressure
1858; 1871-1877	temperature, humidity, pressure, precipitation, cloudcover, winddirection and speed
1878-1883	temperature, pressure

As the record stands now, it can serve two purposes. First, it can extend the present 122-year Nagasaki Observatory series backwards for a number of elements to 1845 and for temperature even to 1819, although this 60-year extension leave gaps for the years 1831-1844 and 1859-1870. Second, the series offer potential to calibrate the long 1700-1868 Nagasaki documentary record [1] with instrumental observations. With these two prospects, the original aims of the recovery project would be largely met.

Digitalization of the series is currently underway. Parallel to this, attempts are still undertaken to find the original lists 1845-1858 and those of the missing years 1857, 1859-1864, as well as those for Nagasaki Hospital in the Dutch or Japanese archives.

References

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