SUPPLEMENT

To the HONGKONG GOVERNMENT GAZETTE of 27th March, 1886.

GOVERNMENT NOTIFICATION.—No. 111.

The following Annual Report from the Director of the Observatory, for the year 1885, is published for general information.

By Command,

FREDERICK STEWART,
Acting Colonial Secretary.

Colonial Secretary's Office, Hongkong, 27th March, 1886.

HONGKONG OBSERVATORY,
4th February, 1886.

SIR,—For the information of His Excellency the Officer Administering the Government, I have the honour to forward my Annual Report for 1885.

2. The first volume of observations and researches was published in July. In this publication there is seldom any reference made to the storms, that so frequently cross the north of China, passing from West to East. These storms are considered to lie outside the field of my researches, but I have endeavoured to thoroughly investigate the typhoons. The available observations were, however, very inaccurate, were not made according to a uniform system and their discussion was found to consume unduly great time, as no isobars could be drawn. In the course of the past year observations with instruments verified here have been commenced at a greater part of the stations belonging to the Imperial Maritime Customs of China. The lighthouses outside of Shanghai were, in 1884, furnished with barometers, which had been compared in the Custom House. I expect to make use of these observations in the investigation of the typhoons of 1885.

3. As there exists in Japan an extensive meteorological service conducted on approved principles, it is unnecessary to investigate typhoons in their course across that empire. With reference to this part of their track, the results published in the weather-maps issued from the Imperial Meteorological Observatory, Tokio, are simply quoted.—A similar service in the Philippine Archipelago is urgently required. As it is, the labour of following typhoons in their transit across these islands is thrown upon this Observatory, and the work has to be done on insufficient data. Through the courtesy of the Superintendent of the Eastern Extension, Australasia and China Telegraph Company I receive observations from Bolinao. At 10 a. and 4 p. daily, a telegram containing observations made at the Observatory of the Jesuit Fathers at Manila is also transmitted, and I receive occasionally registers kept on board ships and by private individuals on shore. I do not find any meteorological register in the newspapers published in Manila. In fact they do not usually publish any information useful for such investigations.—I was informed by Dr. BORIUS, that it was the intention of the French authorities to establish a meteorological observatory in Haiphong, but since the lamented death of this distinguished meteorologist, I have had no further news about this project.

4. It does not appear to have been originally intended to immediately start daily weather-reports and storm-warnings in connection with the Observatory, and no provision was made for such; but immediately on my arrival in the Colony I was instructed to take steps to organise the issue of daily weather-intelligence, for which however no provision was subsequently made in the estimates. The department was thus saddled with a great deal of extraneous work, although the staff was arranged for simply carrying on scientific observations and calculations in the Observatory. The staff is sufficient to carry on the work as originally intended, but is of course insufficient for such a material extension. I understand, that the storm-warnings etc., have been of great advantage to the mercantile community, and hope therefore, that funds to enable me to continue them may be forthcoming from some source. If the public is to have the full benefit of the observations and researches, an additional clerk and a messenger must be appointed.

5. With reference to the Meteorological Signals I submitted, that my Notice of the 25th May, 1885, (substantially the same as the two first paragraphs of my Notice of the 11th August, 1884. Compare *Obs. and Res. 1884*, App. F.) should be published daily in the local newspapers during the typhoon season, so that the shipping community might be made aware of the meaning of those signals, and was informed, that it would appear weekly in the *Government Gazette*, which has been carried out.

6. The gun placed at Tsim-shat-súi for announcing the approach of a typhoon, was, during the year, also fired for announcing the arrival of the mails. On these occasions the sampans and other small craft sought positions of shelter. After the issue of the Post Office Notice I was informed, that this arrangement might be altered when any serious inconvenience was felt, and I would now venture to submit for His Excellency's consideration, whether it is advisable to have the gun fired for both purposes, and if not, what signal should cease.

7. The most important improvement effected during the past year consists in the introduction on the 10th June of the rotating (dry and damp bulb) thermometers for regularly registering temperature and humidity at the Observatory. The figures exhibited in the respective tables during the previous months of 1885 were as far as possible reduced to the same standard by aid of observations made in different screens.

8. By aid of this apparatus the true temperature and humidity of the air round the Observatory is determined and not the temperature in any particular screen, which depends to such a great extent upon the position and form chosen for the latter. A perusal of the forthcoming volume for 1885 will show the advantage of adopting this apparatus at observatories within the tropics, and as it is adapted for use in the arctic regions as well as elsewhere, we are now enabled to make accurate and strictly comparable observations of temperature and humidity over the surface of the entire globe.

9. The thermometers are rotated day and night at as many hours as possible, the intermediate hours being derived from the thermograms using the rotating thermometers as standards.—At the same time tridiurnal eye-observations of thermometers exposed in a Stevenson's screen are made, by aid of which the errors committed by adopting this screen will be determined. This investigation besides its general interest will have its local importance, as a great number of meteorological stations in China have, at my suggestion, been furnished with wooden screens of a nearly similar pattern.—My experience so far shews, that the results obtained with Stevenson's screen are reliable when the screen is freely exposed to the wind, that the accuracy generally increases together with the force of the wind, and that the results are more or less erroneous when the screen is at all sheltered by any object even at a great distance. It would be advisable to adopt the rotating thermometer in making astronomical observations for the determination of the constant of refraction.

10. On the 1st of April the use of Morgan and Kidd's argento-bromide paper was introduced and was found a great improvement.—The sunshine-cards were from the 10th September to the 21st December changed at 10 h. 30 m. a. instead of at 10 h. 30 m. p. as was the case before and after those dates.—The observations of clouds and particularly of the upper clouds being of so great importance for the physic of the globe, have been extended and are now made every three hours.

11. The time-service, which began on the 1st January 1885, will form the subject of a separate report.—The Lee Equatorial, which was transferred to this Observatory by the Astronomer Royal, was erected early in the year in a separate building, the cost of which was charged to Office Contingencies. Observations were made of Jupiter and his Satellites, Saturn and his Rings, and of a few Double Stars.

12. A new Observatory Standard Barometer was received in good order from Casella in London, and apparatus for investigating the temperature and induction-coefficients of magnets from Elliott Brothers, the latter being arranged so that either vertical or horizontal induction can be observed.

13. I attach some importance to the facility thus offered for re-determining the induction-coefficient, as it is known to sometimes change, and more especially in view of Chambers's comparison between two magnetometers, which gave different values for the force at Bombay Observatory. As the magnetometers give identical results when tested at Kew Observatory, the difference might be explained by changes in the induction-coefficients, which were not re-determined.

14. Notwithstanding the acknowledged superiority of Elliott's magnetometers, improvements could easily be introduced. The thermometers are not graduated on the stem, and it is so difficult to remove the one in the vibration box, that a reliable thermometer might with advantage be screwed into the roof of the box as was formerly done. The small telescope should be clamped on the stand and not left merely resting on the Y's, and much finer and stronger screws for adjusting the collimation could be cut in chilled bell metal.

15. As stated in the "instructions for making meteorological observations, &c.," meteorological instruments forwarded by observers, who regularly send their registers to the Observatory, are verified here free of cost. During the past year the following number of instruments has been verified and certificates issued:—

Barometers: 16
Thermometers: 40

16. At the end of 1884 the Swedish man-of-war *Vanadis* visited Hongkong and a party of the scientific staff under the direction of Captain RUDOLF NISSEN spent some days in making magnetic observations at the Observatory, which they chose as one of their principal observing stations, and their meteorological instruments were verified here.

17. Mr. HARDING, Assistant Engineer of the Imperial Maritime Customs of China, spent a week at the Observatory in April and received instruction in the erection of meteorological instruments and similar subjects.

18. A party of Officers under the command of Captain USBORNE MOORE made sextant observations of stars for time at the end of the year and compared with the standard clock. They also chose the anemometer-turret as the centre in their survey of the harbour.

19. Enquiries from officers belonging to the Civil Service, the Army and the Navy as well as from Masters of Merchant Vessels were answered at considerable inconvenience. If the Observatory were connected directly with the Telegraph Offices in Hongkong and a telegraph clerk appointed here, it would be easy to answer any enquiries concerning atmospheric disturbances, made by the public at large, who might be charged a small fee to cover cost of transmission, the same as in England.

20. My thanks are due to Mr. WHIPPLE, Superintendent of the Kew Observatory, for superintending the construction and comparison in London of instruments destined for this Observatory, which has thus had the benefit of his great experience. My thanks are also due to Commander RUMSEY R.N., Acting Harbour Master, for his energetic co-operation.

21. The hill on which the magnetic hut is placed was early last year planted with firs that will when they grow up, contribute to the healthiness of the locality. The southern side of this hill was smoothed and the grass stripped in 1883 by order of the Surveyor General, with the view of having it returfed, but so far this has not been effected.—The summer rains in 1884 shewed the building to be suffering from leakage. Several attempts to repair this were unsuccessful, but I am informed, that the roof will be thoroughly repaired before the coming wet season. My private quarters are very draughty in the winter during the height of the NE monsoon, which is so trying to the health. This cannot of course be helped, as the Observatory should be exposed to the full force of the wind. The growth of rice in the extensive paddy fields north of this was prohibited in 1884, but the ground has not been drained and was during the heavy rains last summer converted into an extensive swamp, to the malaria emanating from which the intermittent and remittent fevers, from which we all suffered, may be ascribed.

22. Mr. FIGG, First Assistant, took charge of the apparatus in the time-ball tower. From the 1st January to the 22nd November, when a new electric lock arrived, the ball had to be dropped by hand, which he effected with no measureable loss of accuracy. Mr. FIGG attended during the year to the self-recording instruments and the tabulations except the thermograms. The latter were tabulated by Mr. MAHOMET ALARAKIA, who has also charge of the galvanic batteries, and during the latter part of the year changed the sheets on the instruments and took charge of the photographic laboratory. Mr. LAU-SHAU, Clerk, has charge of the correspondence, all business transactions and accounts, acts as telegraph clerk, writes out daily weather reports, collects meteorological observations and is responsible for the issue of information concerning typhoons and storm-warnings. I make myself all the astronomical observations and take charge of the horological apparatus.

I have the honour to be,

Sir,

Your most obedient Servant,

W. DOBERCK,
Government Astronomer.

The Honourable THE ACTING COLONIAL SECRETARY.
&c., &c., &c.

Printed and Published by NORONHA & Co., Printers to the Hongkong Government, Nos. 5, 7, and 9 Zetland Street.