

May 21, 1863.

Major-General SABINE, President, in the Chair.

The following communications were read :—

- I. "On the Nature of the Sun's Magnetic Action upon the Earth." By CHARLES CHAMBERS, Esq. Communicated by the President. Received April 30, 1863.

(Abstract.)

If the sun were a magnet of sufficient power to exert a sensible attraction upon a small magnet at the distance of the earth, it would have a real influence on the earth by inducing magnetism in its soft iron, and an apparent one due to the direct action of the sun upon the magnets used for measuring the earth's variations of force. As the earth rotates upon its axis, producing a varying relation, as to position, of the place of observation with respect to the sun, a diurnal variation will thus be produced in the forces which act upon the magnetometers, which variation is shown to follow the simple law  $x = A \sin(h + \alpha)$ ,  $x$  being the deviation of the magnet from its normal position,  $h$  the hour-angle of the sun (and for a single day),  $A$  a constant coefficient, and  $\alpha$  a constant angle. A comparison of this result with the laws of the observed diurnal variations shows that direct and inducing action of the sun is not the sole cause of the variations.

An endeavour is then made to prove that if any part of the observed diurnal variations is due to this cause, it is small in comparison with that produced by other forces in operation. This is done by separating from the observed variations the part of them which obeys the law  $x' = B \sin(h + \beta)$ , and comparing the variations in the values of  $B$  and  $\beta$  from month to month with those of  $A$  and  $\alpha$ , when it is seen that the former obey a law which has but little similarity to the law of variation of the latter.

- II. "Numerical Elements of Indian Meteorology."—Series I. By Dr. HERMANN DE SCHLAGINTWEIT, Corr. Memb. of the Academies of Sciences of Munich, Madrid, Lisbon, &c. Communicated by the President. Received May 4, 1863.

(Abstract.)

In this paper the author communicates Plates in which the iso-

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thermal lines are represented between the latitudes of  $5^{\circ}$  N. and  $36^{\circ}$  W., and longitudes of  $78^{\circ}$  E. and  $98^{\circ}$  E. of Greenwich.

- 1st, of the mean temperature of the year ;
- 2nd, of the cool season, viz. December, January, and February ;
- 3rd, of the hot season, viz. March, April, and May ;
- 4th, of the rainy season, viz. June, July, and August ;
- 5th, of the autumn, viz. September, October, and November.

The memoir which accompanies the Plates contains a statement of the data on which the isothermal lines are founded.

These are : 1. Meteorological researches made by the author and his brothers at various stations in India and the Indian Archipelago during the years 1854–1858.

2. The original manuscripts in thirty-nine folio volumes of meteorological observations made by various observers under the authority of the Indian Government at 207 stations in British India. In regard to the observations referred to under this head, the author considers that he possesses a special qualification for using them advantageously by having himself visited most of the stations, examined the instruments, and acquainted himself with the circumstances of their employment.

The 207 stations are divided into ten geographical groups, as follows :—

1. Eastern India : 1, Assam ; 2, Kharsia Hills. . . . . 12
2. Bengal and Bahar, and Delta of the Ganges and Brahmapútra . . . . . 36
3. Hindostan, the upper Gangetic plain. . . . . 27
4. Panjáb, including the stations west of the Indus . . . . . 24
5. Western India : Rajvára, Guzrát, Kāch, Sindh. . . . . 10
6. Central India : Berár, Orissa, Málva, Bandelkhānd . . . 15
7. 1, Southern India : hilly districts, Dékhan and Maissúr ;  
2, Nílگیرis . . . . . 29
8. Southern India, coasts : Kónhan, Malabar, Karnátik . . 24
9. Ceylon
10. Indo-Chinese Peninsula, Archipelago, and China . . . . 20

Each group has its appropriate processes of reduction, which are severally discussed.