

to the metallic state; its power of forming a strongly acid oxide; and, according to Dr. Miller, the complexity of its photographic spectrum,—all prove that thallium cannot consistently be classed anywhere but amongst the heavy metals, mercury, silver, lead, &c. No weight is attached to M. Dumas's argument in favour of thallium being related to potassium and sodium because its equivalent is rather near a figure obtained by adding twice the atomic weight of one metal to four times the atomic weight of the other. The author shows that, by similar processes of addition, multiplication, or subtraction, it is not difficult to prove that thallium is related to any desired group of elements.

The author gives full analytical notes on thallium, showing where it would occur in the ordinary course of analysis, and detailing accurate methods of separating it from every metal with which it can be accompanied.

*February 26, 1863.*

Major-General SABINE, President, in the Chair.

The following communications were read :—

- I. "On the Effect of Temperature on the Secretion of Urea, as observed on a Voyage to China, and at Hong Kong."  
By EMIL BECHER, M.D., Assistant-Surgeon, Army Medical Staff. Communicated by Dr. EDMUND A. PARKES. Received January 20, 1863.

(Abstract.)

With a view to extend our knowledge of the physiological effects of temperature, with especial regard to the influence of tropical heat on the healthy system, Dr. Becher, with the liberal assistance of the Director-General, Army Medical Department, took advantage of a voyage to China (round the Cape of Good Hope) in 1857, and a short residence at Hong Kong, in order to *determine on himself the influence of the extreme variations of temperature* incidental to that voyage, on the quantity of urine, urea, and chloride of sodium excreted during each twenty-four hours.

During a period of 163 days (100 days at sea, 63 days at Hong Kong during the change of monsoon), Dr. Becher collected the daily quantity of urine, and determined the amount of urea and NaCl by the volumetric method (solutions of nitrate of mercury), and registered meteorological observations as accurately as circumstances would permit, observing all the time as constant a mode of living (with regard to food, exercise, &c.) as was practicable without undue restriction.

The whole of the observations, divided into the two periods indicated, are fully detailed in Tables, and graphically represented in Diagrams.

The results show a most remarkable relation between air-temperature and daily quantity of urea and NaCl, viz. a constant increase with the rising of temperature from  $50^{\circ}$ – $70^{\circ}$ , and an equally constant falling off with the further rise of temperature from  $70^{\circ}$ – $90^{\circ}$ .

The physiological limit of the tropical zone, as marked by the sudden decrease in the quantity of urinary water, is constantly fixed at  $76^{\circ}$ .

Appended is an extract from a manuscript of Dr. Forbes Watson, containing a series of observations on the daily quantity of urine and the amount of solids therein excreted by a number of healthy soldiers in various temperatures during a voyage to India in 1850.

These observations were made by Dr. Forbes Watson, who most kindly consented to their being added here, as far as they serve to illustrate the influence of temperature under otherwise constant conditions. They are tabulated and graphically represented as much as possible on the same plan as those of Dr. Becher, and in their results show the most satisfactory harmony with the latter.