"Le magnétisme terrestre n'est donc que des courants thermo-électriques, et l'aiguille magnétique est un thermoscope qui nous indique les différences des températures des regions hétéro-thermes, dont nous connaissons les distances. Par suite le magnétisme terrestre fait une partie de la climatologie, qui exprime la cause de cette anomale distribution de la chaleur pendant chaque saison et pendant chaque mois. Cette cause se trouve,—1°, dans la conformation géographique de la surface de la terre; et 2°, dans les deplacements diurnes et annuels de notre planete."

10. "On the Physiology and Pathology of Phosphate and Oxalate of Lime, and their relation to the formation of Cells." By William Beneke, M.D. Communicated by Sir James Clark, Bart., F.R.S.

In this paper the author commences by referring to a work recently published by him, entitled "Der Phosphoräsure Kalk in physiologischer und therapeutischer Beziehung," Göttingen, 1850, in which he believes that he has established the indispensable necessity of phosphate of lime to the formation of cells in man, as well as in animals and plants; its deficiency as a cause of disease; and its efficacy administered internally as a means of alleviation or cure in the treatment of such disease. He cites from Liebig various proofs of the necessity of the presence of phosphate of lime for the formation of nitrogenous compounds in plants; and from Carl Schmidt, that it has an intimate relation to the formation of cells in invertebrate animals; and argues from his own experiments, that it has the same relation to the formation of cells in the higher classes of animals and in man. These experiments consisted, first, in the chemical examination of various pathological exudations, such as the serum produced by blisters, the secretions of wounds, ulcers, &c., the result of which satisfied him, that, wherever a formation of cells took place, phosphate of lime was present in considerable quantity; and wherever it was absent, he could not detect any phosphate. He believes that from a mixture of albumen, pure fat and phosphate of lime, put in a sand-bath at 104°, he has succeeded in artificially producing cells, which he describes and figures in various stages. He further adduces, in proof of his theory, the beneficial results of the treatment of various diseases connected with dyscrasia, by the administration of phosphate of lime. In such diseases he states that a much larger quantity of the phosphates is removed from the œconomy by the urine than in the normal state; and this he determines by a multitude of observations conducted on a method of analysis proposed by Dr. Heinz of Berlin. This increased elimination of the phosphates he attributes to the presence of oxalic acid, the existence of which in the urine he regards as always indicative of disease. On this subject he refers to the works of Dr. Prout, Dr. Golding Bird and Dr. Bence Jones, and compares the results of his own observations with those of the authors cited, giving figures of the various forms of oxalate of lime, and diagrams of the diurnal variations of the acidity of the urine, of its specific gravity, and of the phosphates and oxalates of lime contained in it, in two remarkable cases. From

a series of experiments on bones, he comes to the conclusion, that oxalic acid is the solvent for the phosphates in the animal œconomy; and deduces the production of oxalic acid, and especially of its hypernormal quantities,—first, from a hypernormal quantity of non-nitrogenous food, such as sugar, starch and farinaceous substances; and secondly, from want of sufficient oxygen taken from the air, as in malarious situations, or in the cases of persons suffering from disease of the lungs. The results of the author's observations are finally summed up in the following terms:—

1. That in the human œconomy, as well as in plants and in the inferior animals, the production of cells indispensably requires the presence of phosphate of lime.

2. That a deficient formation of cells in morbid affections of the system almost invariably indicates a deficiency of phosphate of lime; and that the administration of phosphate of lime has proved most beneficial in such affections.

3. That this deficiency of phosphate of lime is proved really to exist by the hypernormal quantities of phosphates eliminated by the urine in almost all the cases in which a deficient formation of cells or a want of flesh exists.

4. That this elimination of phosphates is caused by the oxalic acid which is produced in the œconomy in health as well as in disease, and causes the elimination as well of the normal as of the hypernormal quantities of the phosphates.

5. That the production of oxalic acid in preternatural quantities depends on different causes, the principal of which are,—the use of abandant quantities of saccharine and farinaceous food; the want of sufficient reception of oxygen by the lungs; a morbid decomposition of uric acid into urea and oxalic acid; and very probably the presence of abundant quantities of alkali in the blood.

6. That, consequently, by putting a stop to the production of hypernormal quantities of oxalic acid, we shall stop the elimination of hypernormal quantities of the phosphates, and consequently promote the formation of cells, supposing a sufficient quantity of nitrogenous and non-nitrogenous substances to be present.

11. "Supplementary Observations on the Diffusion of Liquids." By Thomas Graham, Esq., F.R.S., F.C.S.

The former experiments of the author furnished strong grounds for believing that isomorphous salts possess a similar diffusibility. All the salts of potash and ammonia, which were compared, appear to be equi-diffusive; so also were the salts of certain magnesian bases. A single preliminary observation on the nitrates of lead and baryta, however, opposed the general conclusion, and demanded further inquiry. It is scarcely necessary to say that any new means of recognizing the existence of the isomorphous relation between different substances, must prove highly valuable. The investigation was also extended to several new substances, such as hydrocyanic acid, acetic acid, sulphurous acid, alcohol, ammonia and salts of organic bases, without reference to isomorphous relations.