

the other toes are all thicker on the side turned towards the middle toe. That of the second toe is almost as square as that of the third; but the distal angles of that of the third and fourth are bevelled off on the fibular side, while the terminal phalanx of the hallux is similarly bevelled off upon the tibial side. The metatarsal bones have the same thick prismatic form, and the proximal phalanges the same discoidal character as in the fore foot.

The calcaneal process is directed outwards at an angle of 45° from the axis of the foot, and must have been much raised in the natural position.

While the work of restoration, whose results have just been briefly detailed, was going on, we learned from Dr. Falconer that a nearly entire specimen of a *Glyptodon* was exhibited in the Museum at Turin. An application was at once made to the authorities of the Museum for information, and, if possible, for photographs of this skeleton, and was responded to with the most obliging readiness.

These photographs of a skeleton in some respects more, in others less perfect than that of the College, have confirmed the conclusions already arrived at in the most satisfactory manner; and I trust before long to be in possession of descriptive details of parts of this specimen which are wanting in our own, and which will enable me to complete the anatomy of the skeleton of the gigantic extinct Armadillo.

II. "On the Relation of Aqueous Vapour to Radiant Heat."

By JOHN TYNDALL, F.R.S. &c. Received November 20, 1862.

(Abstract.)

The object of this paper is to prove to meteorologists that they may apply, without misgiving, the results which the author has already announced, regarding the relation of aqueous vapour to radiant heat. The author describes new experiments made with dry and humid air, first, with an experimental tube stopped by plates of rock-salt; secondly, with an open experimental tube; and thirdly, with an arrangement in which both the plates and the tube were abandoned,

dry air being caused to displace moist, and moist air dry, in the open atmosphere. He considers and removes objections, and points out the bearing of his experiments on various questions in meteorology. The formation of cumuli and the cause of the tropical rains are considered ; the effect which the absence of aqueous vapour must have upon climate is pointed out ; and the *à priori* conclusions to be drawn from the experiments are shown to agree with observation. Reference is made to anomalies of observation which have been hitherto unexplained, but which admit of easy solution by reference to the radiant and absorbent power of aqueous vapour. The author endeavours to supplement the views hitherto entertained regarding the action of mountain masses as condensers of the atmospheric moisture. He accounts for the enormous radiation observed at great elevations, and concludes by showing the possible bearing of his results on the theory of “*Serene*” and of hail.

III. “Distribution of the Surface of the Third Order into Species, in reference to the absence or presence of Singular Points, and the reality of its Lines.” By Dr. SCHLÄFFLE, Professor of Mathematics in the University of Berne. Communicated by ARTHUR CAYLEY, Esq. Received December 18, 1862.

(Abstract.)

The theory of the 27 lines on a surface of the third order is due to Mr. Cayley and Dr. Salmon ; and the effect as regards the 27 lines of a singular point or points on the surface, was first considered by Dr. Salmon in the paper “On the triple tangent planes of a surface of the third order,” *Camb. and Dub. Math. Journ.* t. iv. pp. 252–260 (1849). The theory as regards the reality or non-reality of the lines on a general surface of the third order, is discussed in Dr. Schläffle’s paper, “An attempt to determine the 27 lines, &c.,” *Quart. Math. Journ.* t. ii. pp. 56–65, and 110–120. This theory is reproduced and developed in the present memoir under the heading, I. General cubic surface of the third order and twelfth class ; but the larger part of the memoir relates to the singular forms which are here first completely enunciated, and are considered under the headings II.,