Extracted from the Proceedings of the Academy of Natural Sciences, April, 1876.]

On a Gigantic Bird from the Eocene of New Mexico.—Prof. COPE exhibited a tarsometatarsus of a bird, discovered by himself during the explorations in New Mexico, conducted by Lieut. G. M. Wheeler, U. S. A. The characters of its proximal extremity resemble in many points those of the order *Cursores* (represented by the *Struthionidæ* and *Dinornis*), while those of the distal end are, in the middle and inner trochleæ, like those of the *Gastornis* of the Paris Basin. Its size indicates a species with feet twice the bulk of those of the ostrich. The discovery introduces this group of birds to the known faunæ of North America recent and extinct, and demonstrates that this continent has not been destitute of the gigantic forms of birds, heretofore chiefly found in the Southern Hemisphere faunæ. The description is as follows:—

The hypotarsus is moderately prominent, with broad truncate face, and does not inclose the ligamentous groove of its inner side. Its superior angle is broken away in the specimen. The two foramina which pierce the shaft just below the head, are well separated from each other both on the posterior and anterior faces, marking nearly equal thirds of the transverse diameter of the bone. The cotyloid cavities for the tibio-tarsus are bounded by an elevated margin, and are separated medially by a single low oblique ridge. The groove of the posterior face is particularly wide, and the inner part of the shaft is thinned, while the outer border is broadly convex. The proximal part of the inner border (as far as it is preserved) is marked with a flat surface which is roughened with ridges, which is perhaps the sutural articulation of the proximal end of the metatarsus of the hallux. No such surface exists on the corresponding bone of the ostrich or emeu. Only two of the free distal phalangeal extremities are preserved. The shaft is broken, showing that its interior is filled with cancellous tissue. The free extremities are remarkable for the great inferior extent of the articular trochlear face. The median is strongly grooved with an obtuse excavation, and the lateral or bordering ridges are equal and rounded. The groove is continuous with the superior surface, but not with the inferior. There the convergent lateral ridges inlosing the open groove, terminate in an abrupt elevation above the adjacent surface of the shaft. The sides at this point are concave. The inner free condyle has an oblique articular face, the external ridge dropping away internally as in many birds, and produced beyond the inner ridge, distally. The articular face becomes then a part of a spiral, and is little grooved above, but strongly grooved

medially. The vertical diameters of the sides differ, the inner being much greater, and both are concave. A strong foramen pierces the shaft just within the point of junction of the inner and medial free extremities.

Measurements.		M.
Transverse diameter of proximal end of tarsometatarsus		.100
Antero-posterior do. (partly inferential)		.070
Interval between penetrating foramina on anterior face shaft		.017
Median distal condyle	Long diameter	.050
	Vertical diameter	.048
	Transverse diameter	.040
Internal distal condyle	Long diameter	.037
	Vertical diameter	.040
	Transverse diameter	.031

The large size and wide separation of the penetrating foramina, and the thin internal edge with sutural articular facet, distinguish this form as distinct from any of the genera of Struthionidæ and Dinornithidæ. It is therefore named *Diatryma gigantea.*

On the Theory of Evolution.—Prof. COPE gave a history of the progress of the doctrine of evolution of animal and vegetable types. While Darwin has been its prominent advocate within the last few years, it was first presented to the scientific world, in a rational form, by Lamarck of Paris, at the commencement of the present century. Owing to the adverse influence of Cuvier, the doctrine remained dormant for half a century, and Darwin resuscitated it, making important additions at the same time. Thus Lamarck found the variations of species to be the primary evidence of evolution by descent. Darwin enunciated the law of "natural selection" as a result of the struggle for existence, in accordance with which "the fittest" only survive. This law, now generally accepted, is Darwin's principal contribution to the doctrine. It, however, has a secondary position in relation to the *origin* of variation, which Lamarck saw, but did not account for, and which Darwin has to assume in order to have materials from which a "natural selection" can be made.

The relations exhibited by fully grown animals and plants with transitional or embryonic stages of other animals and plants, had attracted the attention of anatomists at the time of Lamarck. Some naturalists deduced from this now universally observed phenomenon, that the lower types of animals were merely repressed conditions of the higher, or in other words, were embryonic stages become permanent. But the resemblances do not usually extend to the entire organism, and the parallels are so incomplete, that this view of the matter was clearly defective, and did not constitute an explanation. Some embryologists, as Lereboullet and Agassiz, asserted that no argument for a doctrine of descent could be drawn from such facts.