

coil by *continuously* heating the iron wire. In several experiments, by employing twelve similar Grove's elements as a double series of six intensity, an iron wire 1.56 millim. diameter was made *bright* red-hot; and by keeping the current continuous until the galvanometer-needles settled nearly at zero, and then suddenly disconnecting the battery, the needles remained nearly stationary during several seconds, and then went rapidly to about 10: this slow decline of the current during the first few seconds of cooling was probably connected with the "momentary molecular change of iron wire" during cooling which I have described in the preceding paper. The irregularity of movement of the needles did not occur unless the wire was *bright* red-hot, a condition which was also necessary for obtaining the molecular change.

The direction of the current induced by *heating* the iron wire was found by experiment to be the same as that which was produced by removing the magnet *from* the coil; therefore the heat acted simply by *diminishing* the magnetism, and the results were in accordance with, and afford a further confirmation of, the general law, that wherever there is increasing or decreasing magnetism, there is a tendency to an electric current in a conductor at right angles to it.

February 4, 1869.

Dr. WILLIAM ALLEN MILLER, Treasurer and Vice-President,
in the Chair.

The following communications were read:—

- I. "On Fossil Teeth of Equines from Central and South America, referable to *Equus conversidens*, *Equus tau*, and *Equus arcidens*."
By Professor OWEN, F.R.S. Received November 17, 1868.

(Abstract.)

The author, referring to his previous paper on the Equine fossil remains from the cavern of Bruniquel, finds, in the preliminary illustrations of the dental characters of existing species of the Horse-kind, the requisite and much-needed basis of comparison for the determination of other fossils of the Solidungulate group, and he devotes the present paper to the elucidation of those which have reached him from Central and South America.

He commences by referring to the type-specimens of teeth, from two localities in South America, on which he founded the species *E. curvidens*, describing it (in 1840) "as one coexisting with the Megatherium, Toxodon, &c. in that continent, and which had become extinct at a prehistoric period."

He then proceeds to describe more complete evidences of the dentition of an allied extinct Horse discovered by Don Antonio del Castillo, mining engineer, in newer Tertiary deposits of the Valley of Mexico. Besides repeating the originally described characters of the curvature of

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the grinder, with a certain resemblance of enamel-pattern to the grinding-surface of the *E. curvidens*, they show a greater degree of curvature of the alveolar series of the upper jaw, with corresponding greater convergence of the right and left molar series toward the fore part of the palate, than in any previously described species of *Equus*.

Deciduous teeth of the *Equus conversidens* from the same deposits of the Valley of Mexico are described. Having determined these corroborative and distinctive characters of aboriginal and now extinct American horses, the author remarks, "It is unlikely, seeing the avidity with which the Indians of the Pampas have seized and subjugated the stray descendants of the European horses introduced by the Spanish 'Conquistadors' of South America, and the able use the nomad natives make of the multitudinous progeny of those war-horses at the present day, that any such tameable Equine should have been killed off or extirpated by the ancestors of the South-American aborigines." If, therefore, the fossil Equine teeth do belong, as the author deems that he has proved, to a species distinct from *Equus caballus*, Linn., "the circumstances of their discovery, and the fact of the extinction of such (curvident and conversident) species of Horse would point to some other cause than that of man's hostility to so useful an animal, and such doubt as to extinction by human means may then be extended to the contemporaries of the *Equus curvidens* and *E. conversidens*, viz. *Megatherium*, *Myiodon*, *Toxodon*, *Nesodon*, *Macrauchenia*, *Glyptodon*, *Mastodon*, &c."

The author next proceeds to describe fossil teeth from the upper and lower jaws, discovered by Don A. del Castillo in the same deposits of the Valley of Mexico, and referable to a third species of *Equus*, viz. *Equus tau*, Ow. Finally the author proceeds to the description of some fossil upper molar teeth from Pampas deposit, in the bed of a brook falling into the "Arroyo Negro" near Paysandi, Monte Video, showing characters more decisively distinct from any other known species of *Equus* than have hitherto been described.

The degree of curvature of the upper molar teeth exceeds that in *Equus curvidens*, and equals that in *Toxodon*; and the specific name "*arcidens*" is accordingly proposed for this aboriginal American species of Horse. It is compared with so much of the characters as have been given by Dr. Lund of his *Equus neogæus* and *E. principalis* from Brazilian caverns; and the differences from all other Equines which these species and the *E. arcidens* agree in presenting lead the author to view them as having, like the *Hippotherium* of Kaup, formed a generic group in the *Equidæ*, for which he proposes the name *Hippidion*.

The fossil teeth of *H. arcidens* were found associated with remains of *Megatherium* and *Glyptodon* in the above-named locality; the specimens were transmitted and presented to the British Museum (in 1867) by the Hon. W. G. Lettsom, Her Britannic Majesty's Minister at Monte Video.

This paper is illustrated by drawings of the specimens described.