

II. "On the Affinities of Thylacoleo." By Professor OWEN, C.B., F.R.S., &c. Received January 25, 1883.

(Abstract.)

Since the communication of the paper "On Thylacoleo," in the "Philosophical Transactions" for 1871, further explorations of the caves and breccia-fissures in Wellington Valley, New South Wales, have been made, by a grant for that purpose from the Legislature of the Colony, and carried out by E. B. Ramsay, Esq., F.L.S., Curator of the Museum of Natural History, Sydney. The present paper treats of the fossils contributing to the further restoration of the great carnivorous Marsupial (*Thylacoleo carnifex*, Ow.). They exemplify the entire dentition *in situ* of the upper and lower jaws of a mature individual: the bones of the fore-limb, of which those of the antibrachium and the ungual phalanges are described, are compared with those of other Marsupials, and of placental, especially feline, *Carnivora*. An entire lower jaw with the articular condyles adds to the grounds for determination of the habits and affinities of the extinct Marsupial.

Figures of these fossils of the natural size accompany the paper.

III. "Preliminary Note on a Theory of Magnetism based upon New Experimental Researches." By Professor D. E. HUGHES, F.R.S. Received January 27, 1883.

In the year 1879* I communicated to the Royal Society a paper "On an Induction Currents Balance and Experimental Researches made therewith." I continued my researches into the molecular construction of metallic bodies, and communicated the results then obtained in three separate papers† bearing upon molecular magnetism.

To investigate the molecular construction of magnets required again special forms of apparatus, and I have since been engaged upon these, and the researches which they have enabled me to follow.

From numerous researches I have gradually formed a theory of magnetism entirely based upon experimental results, and these have led me to the following conclusions:—

1. That each molecule of a piece of iron, steel, or other magnetic metal is a separate and independent magnet, having its two poles and distribution of magnetic polarity exactly the same as its total evident magnetism when noticed upon a steel bar-magnet.

* "Proc. Roy. Soc.," vol. 29, p. 56, 1879.

† "Proc. Roy. Soc.," vol. 31, p. 525; vol. 32, pp. 25, 213, 1881.