

For such systems  $A_i$ , as we have considered, all projective properties will be corresponding to each other, and all metrical properties at least as far as they are dependent upon the interpretation of the constants employed. EMANUEL LASKER.

Ikley, July 9.

P.S.—The same holds true, with slight modifications, for the only curved space that contains no exceptional elements, that is the surface of a globe of  $n$  manifoldness.—E. L.

#### The Feigning of Death.

THE discussion, a few months since, of the feigning of death in reptiles (vols. li. pp. 107, 128, 223, and lii. p. 148), induced me to experiment on the Currant Moth, whose powers of "shamming" are so familiar. The moth was first seized by one wing, and it at once feigned death; thereupon I cut off its head with a pair of scissors, and the animal continued to feign death. I use the expression advisedly, for absolute immobility was maintained for some seconds, and then violent fluttering ensued, causing the animal to rush wildly about the table, but failing to lift it into the air. In this condition any impulse, such as touching or pinching, induced a repetition of "shamming." After a strong stimulus the shamming was prolonged, and indeed a direct connection was obvious between the strength of stimulus and the length of period of quiescence. This power of response to stimulus was maintained for two days, and then weak fluttering set in for some hours, followed by death. Our entire ignorance of the physiology of the nervous system of insects renders it difficult to draw complete conclusions from these phenomena; nevertheless, it is difficult to conceive that volition can persist for forty-eight hours in a decapitated animal. We are forced then to conclude that here, at any rate, death-feigning is a purely reflex phenomenon, and that the sensory stimulus received by the surface of the body causes inhibitory impulses to arise reflexly from the ganglia of the central nerve chain, and prevent all movement of the locomotor muscles. In confirmation of this, it may be mentioned that denuding the wing of its scales over any area caused a marked diminution of sensitiveness over the area so treated. Since all stages between sensory hairs and ordinary scales occur in Lepidoptera, it is not unreasonable to assume that the scales still function as tactile end-organs, in spite of their modification subserving decorative purposes. OSWALD H. LATTER.

Charterhouse, Godalming, July 31.

#### Halley's Chart of Magnetic Declinations.

IN NATURE for May 23 and 30, 1895, are interesting communications from Dr. Bauer and Mr. Ward in reference to Halley's old chart of magnetic declinations.

I have a copy of this chart not referred to by either of these gentlemen.

It is bound in vol. i. of "Miscellanea Curiosa." This work was edited by Halley; it consists of three volumes, containing, in the main, reprints of papers read before the Royal Society. Vol. i. was published in 1705, and was printed by J. B., for Jeffery Wale and John Senex.

The chart is  $7\frac{1}{2}$  inches high and 13 inches long, and embraces just the circumference of the earth.

The title in the upper left-hand corner reads: "A new and correct Sea Chart of the Whole World, showing the Variations of ye compass as they were found Año 1700 with a view of the General and Coasting Trade Winds and Monsoons or shifting Trade Winds by the Direction of Capt. Edm. Halley."

In the lower left-hand corner is the note: "Capt. Halley's map of the World in two large sheets is sold by R. Mount and T. Page on Great Tower Hill, London."

The name "I. Harris, delin. & scu." is in the lower right-hand corner of the chart. CHARLES L. CLARKE.

New York, July 27.

#### THE ERUPTION OF VESUVIUS, JULY 3, 1895.

THIS recent disturbance at Vesuvius is interesting in several ways, and at one time had all the appearance of developing into as grand a display as that of 1872.

The last eruptive cycle of Vesuvius commenced on June 7, 1891, when I had the good fortune to be but a

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few hundred yards distant at the time the main bursting of the rift took place. The details of that eruption, with illustrations, can be referred to in my articles and reports.<sup>1</sup> We may briefly state that cycle as follows: the splitting of the whole of the great cone of Vesuvius by a radial rift which extended beyond the base for some distance across the Atrio del Cavallo. At the first moment a little lava issued from the upper part of the rift, but after a few hours all came from its lowest extremity in the Atrio, and continued to flow with practically no interruption for a period of nearly three years, or, more correctly, from June 7, 1891, to February 7, 1894. During that period no great quantity was given forth at any one time, so that no stream could attain much length before cooling. Though the amount emitted during that period is enormous, and if vesicularised into pumice and scoria would, I think, quite equal Monte Nuovo in volume. The consequence of this is, that a great and pure lava cone was built up in the Atrio, of low inclination ( $14^\circ$ ), and adding much to obliterate that interesting and characteristic feature of the volcano. Coincident with the formation of the rift, the central cone rapidly crumbled in, until a deep crater was formed which eventually attained over 150 m.

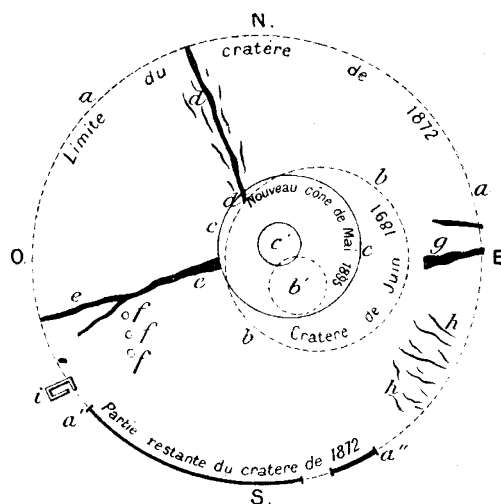


FIG. 1.—Diagram showing the actual state of Vesuvius, from a drawing by M. A. Bourdariat, after an earlier plan of mine (*La Nature*, June 8, 1895). (a) Limit of the crater edge of 1872; the part represented by a dotted line is that covered by more recent lavas of different dates. The parts  $a'$  and  $a''$  are still uncovered. (b) Crater of June 1891. (c) Active vent of the 1891 crater. (d) New cone in process of formation (May 1895). (e) Active vent of the cone on May 12, 1895. (f) Rift and vapour mouth of June 7, 1891. (g) Fissure emitting acid vapours on crater plain formed in the 1872 crater. (h) Very old hot-air passages and fumaroles. (i) Fissure of May, 1889. (j) Numerous fissures on the south-east edge of the crater plain. (k) Guides' shelter.

in depth and diameter. It was at its greatest dimensions in February 1894, when the lava stopped issuing by the lateral outlet, and therefore commenced to rise in the chimney. The immediate result of that stoppage was that the formation of a cone was soon commenced at the bottom of the crater by the ejection of lava cakes. The growth of this new cone of eruption was so rapid that, when I visited and photographed the interior of the 1891 crater in November last, this was not above 60 or 70 m. deep, and the cone of eruption was rapidly increasing in height within it.

My friend M. Alex. Bourdariat has carefully observed the

<sup>1</sup> "Il Vesuvio," *Corriere di Napoli*, June 10, 1891. "L'Eruption du Vésuve," *L'Italie*, Rome, June 13, 1891; *Le Figaro*, Paris, June 17, 1891. "The Eruption of Vesuvius," *Mediterranean Naturalist*, Malta, July 1 and August 1, 1891. "Lettre sur l'Eruption du Vésuve," *L'Italie*, Rome, July 18, 1891. "L'Eruption du Vésuve, visites d'exploration au Volcan," *La Nature*, August 8, 1891 (illustrated). "The Eruption of Vesuvius," *NATURE*, vol. xlv. pp. 160-161, 320-322, and 362 (illustrated). "Report British Association," 1891-92-93-94. "L'Eruzione del Vesuvio," *Rassegna delle Scienze Geologiche*, vol. i. Rome, 1891 (illustrated).