

members" previous torsion, and precision is impaired; the iron "remembers" the preceding cycle, and energy is wasted in concentrating its wandering attention.

Not the least remarkable thing about falling stones, and gravitational action in general, is the lack of hysteresis, or memory.

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LAG AND LEAD WITH A BRAUN TUBE

IN arranging an experiment to show lag and lead with a Braun tube I hit upon a method that was very effective and may possibly be of use to others.

The tube, with its axis horizontal, was excited by an induction coil with a break of variable speed. Two coils were used to produce the magnetic field, one with its axis vertical, and the other with its axis horizontal, and both with axes perpendicular to the axis of the tube. The distance of the one coil from the tube could be varied. If an alternating current was sent through the coil with horizontal axis it would produce a vertical line on the fluorescent screen when the tube was excited. If now the period of the vibrator of the coil was changed until the frequency of the alternating current was nearly equal to a multiple of the frequency of the coil the stroboscopic effect would make the spot of light move slowly up and down on the screen. With the current flowing through the other coil the spot would move back and forth on the screen. When the alternating current from the same source is led into both coils the spot moves up and down diagonally at an angle of 45°.

If now considerable inductance is introduced into one circuit the spot will move around in an ellipse in one direction, but if a condenser takes the place of the inductance the spot moves in an ellipse in the *opposite* direction. Varying the inductance varies the width of the ellipse so that the amount of lag or lead is roughly indicated. If both inductance and capacity are put into the same circuit the width of the ellipse is reduced,

showing the neutralizing effect of capacity on inductance.

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A SECOND OCCURRENCE OF ICHTHYOSAURIAN REMAINS IN THE BENTON CRETACEOUS

IN 1905¹ Dr. John C. Merriam announced the discovery of Ichthyosaur-like remains in the Benton of Wyoming. That it was not an accidental occurrence now appears to be indicated by the finding of a second specimen in these same beds. Recently I have received for examination a single badly worn vertebral centrum, collected during the summer of 1913 by Mr. C. J. Hares, of the U. S. Geological Survey in the Mowrey shales, some 12 miles west of Casper, Wyoming. This vertebra is of the typical biconcave ichthyosaurian type and in its present condition is indistinguishable from those of *Baptanodon*. The fragmentary nature of the specimen precludes the possibility of determining its true generic affinities, but as recording a second occurrence of ichthyosaur-like remains in the Benton, the specimen is at the least of interest.

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A MISNAMED PORTRAIT OF JOHN SHAW BILLINGS

TO THE EDITOR OF SCIENCE: Dr. S. Weir Mitchell's appreciative memoir of the late Dr. Billings in your current issue is not accompanied by a picture and does not refer to one; so the present note may be acceptable. On p. 223 of Vol. VII. of the "Photographic History of the Civil War" the upper right portrait represents Dr. Billings during the war as an assistant surgeon with the rank of first lieutenant; it is misnamed "Brevet Lieut. Col. J. J. Woodward." This legend really belongs to the lower left portrait, which in turn is misnamed "Brevet Major C. B. Greenleaf." To which of the two other portraits this belongs I can not say. In this connection may be noted another error in the work above named. In Vol. X., on p. 263, the portrait named "David R. Jones" is that of Samuel

¹ SCIENCE, N. S., Vol. XXII., No. 568, pp. 640-641.