However, Dr. Blackwelder's evidence of the deeply corroded limestone blocks must be explained before a modern dating can be satisfactorily applied to the meteor fall. Whether or not sufficient heat could have been generated to partially calcine the blocks and thereby render them prone to rapid corrosion is debatable, but is still a possibility. If such calcining took place, the advanced state of corrosion might have resulted in a matter of months, even with little rainfall.

All in all, it seems that the date of the great meteor's fall is still much in doubt. Whether the fall was recent, as Barringer suggests, or ancient, as Blackwelder holds, depends upon which way you wish to interpret the known facts. I agree with Blackwelder that the layer of volcanic ash in the lake will play a great part in settling the point. Dr. Douglass' date on the ash fall that buried the timbers of the Arizona pit houses and subsequent similar information that will be massed in the near future will be keystones to the problem.

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THORNDIKE'S PROOF OF THE LAW OF EFFECT

As one of "the great majority of psychologists" who have criticized Thorndike's "law of effect,"[1] for which he now presents a positive proof,[2] I venture to suggest that this law is insusceptible of proof except on premises which many psychologists, and also many biologists, will not accept.

The statement that a "satisfying after-effect strengthens directly the connection producing it" can be maintained only under the assumption that a course of behavior consists of a number of separate and discrete acts; whereas, if the fundamental premise of all behavior be Coghill's principle that "the behavior pattern expands from the beginning throughout the growing normal animal as a perfectly integrated unit,"[3] all end-effects are consummatory, and it is not permissible to rule them out of experiments such as Thorndike records. Furthermore, Thorndike's report that the effect of a reward is noticeable in the unrewarded results that occur in proximity to those that are rewarded supports the view that learning is a self-regulating process, the parts of which are not discrete acts, but members of the whole unit of action.

What Thorndike's experiments seem to demonstrate is the effectiveness of learning without recourse to "repetition or frequency of occurrence, recency, intensity." What they do not demonstrate is that conditions have been equalized in respect of "finality, or consummatoriness, tendency to attain equilibrium and other features of the process [that] have been alleged to be adequate to explain the strengthening of connections." They do not demonstrate inadequacy of these last-named features, because these features suggest a dynamic interpretation at variance with Thorndike's assumption that learning consists in strengthening connections between parts otherwise discrete and independent.

Thorndike, himself, suggests the necessary correction to his theory when he states that "a satisfying after-effect strengthens greatly the connection which it follows directly *and to which it belongs*" (italics mine). As has been pointed out by other critics,[4] it is not *pleasure* but *success* which stamps in the right action; and it may be said to do so because the whole process is from the beginning a "perfectly integrated unit." Although the process may be disrupted, so long as learning is taking place every achievement is a consummatory process, the end-effect of which is one of finality because equilibrium has been attained. The end-effect "belongs" to what has gone before because it is an integral part of the entire unit of action. It is therefore not an "after-effect" of this action.

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THE EARLIEST DATED DWELLING IN THE UNITED STATES

ABOUT the year 660 A. D. some timbers were cut on the slopes of the San Francisco Mountains in Arizona and used in a dwelling. Twelve of these timbers, now a mass of charcoal, have been dated by tree-ring studies and have given us the earliest date for an American home. This dwelling is 124 years older than our previously dated oldest dwelling.

The site from which the charred timbers were secured was a rectangular pithouse (N. A. 1531), belonging to the period in Southwestern archeology known as Pueblo I.

Previous to this time the earliest dated dwelling in the Southwest was a pithouse occupied in 784 A. D. This belonged to the period called Pueblo II. We have now not only the earliest dated house but also the first reported date in Pueblo I.

These earliest dated pithouses were excavated by the Museum of Northern Arizona, Flagstaff, Arizona, under the direction of Lyndon L. Hargrave, Field Director and the timbers dated by John C. McGregor, curator of dendro-chronology.

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[1] *Cf.*, *Psych. Rev.*, 20: 188 *ff.* 1913.
[2] SCIENCE, 77: 173. February 10, 1933.
[3] *Cf.*, G. E. Coghill, *Arch. of Neur. and Psychiat.*, 21: 989. 1929.
[4] *Cf.*, H. Cason, *Psych. Rev.*, 39: 440, 1932; M. H. Trowbridge and H. Cason, *Jour. of Gen. Psych.*, 7: 245, 1932; E. C. Tolman, C. S. Hall and E. P. Bretnall, *Jour. of Exp. Psych.*, 15: 601, 1932.