of 61 Broadway, and to submit that their claim is not "fair," in fact, it has done harm in certain localities.

V. CONCLUSION

Not only a scientific but also a great moral and humanitarian issue is involved. It is to be regretted that the Rockefeller Foundation has not complied with a duty it owes to the rural children of the South, to the scientific world, to itself and to Mr. Rockefeller (Senior and Junior), frankly and publicly to modify its *ex cathedra* claim in harmony with facts.

Economics, education, welfare, health and even human life are involved.

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CAN A PUBLICATION BE CAMOUFLAGED?

THE persistence of the faith that in some mysterious manner material may be distributed to the public without being published, by the mere device of mimeographing instead of printing, was again illustrated at the Atlantic City meeting. In at least two societies during discussions of the still vexed question of publishing abstracts, "mimeographed" as a substitute for "printed" abstracts were urged on the alleged grounds that "publication" would thus be avoided.

In his discussion "What is a Publication?"[1] Storer points out that the method used in reproduction has no bearing on the question of publication. He cites among other examples the experience of the Biological Survey with *Bird Banding Notes,* a mimeographed publication which when it was initiated bore a note on the first page of each issue—"Bird Banding Notes is not a publication and is not for general distribution." In spite of this, however, the scientific value of the contained matter soon became evident and the material was cited by other investigators. I am further informed by the Biological Survey that *Bird Banding Notes* is now being sent regularly to *Biological Abstracts* at the request of the editor of that review journal.

The *Plant Disease Reporter* is a case in point. This mimeographed serial was established in 1917, as a means of making readily available to working pathologists incidental information thought to be of transient rather than of permanent interest and which should be placed in their hands more quickly than was possible through any available printed medium. The result was a collection of mimeographed notes, the popularity of which was immediately attested by the material presented as well as by the demands for the *Bulletin,* as it was then called. In 1923, to still further emphasize the informal nature of the series, the name was changed to *Reporter.* In spite of this, the actual scientific value of the material included has been abundantly attested by its repeated citation in regularly printed scientific literature and by numerous reviews of its contents in the *Review of Applied Mycology* everywhere recognized as the standard review journal for mycological and plant pathological literature.

It is obviously possible for a group of workers in a limited field, for example, taxonomists, to bind themselves not to recognize species published by a particular method or for that matter in a special group of languages or in a particular color of ink. But general scientific matter disseminated in any form available for more or less permanent record is certainly scientifically published, whatever the method of duplicating employed.

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[1] SCIENCE, n. s., 75: 486–487, 1932.

THE AGE OF METEOR CRATER

IN SCIENCE,[1] Professor Blackwelder proposes that the Coon Butte crater in Arizona is of the Post-Tahoe epoch, some forty to seventy-five thousand years old. This decision is supported primarily by the evidence of the lake bed in the crater proper. However, in connection with the lake-bed a statement is made that I feel needs some correction. On page 559, Dr. Blackwelder states concerning a layer of rhyolitic ash in the lake bed: "The bed of volcanic ash is plainly the record of an explosive eruption somewhere in the south-western arid region. *No such eruption is known to have occurred since Pleistocene (late glacial) times.* If the age of this shower is ever determined it may afford important evidence regarding the age of Meteor Crater." (The italics are mine). It happens that the date of the shower mentioned is probably known accurately. At a meeting of anthropologists in Santa Fé during September, 1931, the Arizona University party reported the discovery of pit houses filled with ash, not too distant from the Meteor Crater. Wood was recovered from these and has been dated by Dr. Douglass, using his tree-ring calender. It had been buried by an eruption that took place in the neighborhood of 793 A. D. If the two showers are identical, then Barringer's dating of 2,000 to 3,000 years ago is probably the most acceptable of all.

Much supporting evidence for the inter-glacial dating is drawn from the formation and degradation of the talus slopes. I feel strongly that we can not draw analogies from the formation of talus where the only agents are those normal to a moist and colder climate. There is no doubt in my mind that the talus slopes were built up by the impact and explosion and not by the usual forces that disintegrate cliff faces.

[1] Vol. 76: No. 1981, pp. 557–560, December 16, 1932.

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.