The literature of archeology, it will be found, furnishes strong support to this conclusion. For want of space, only a single brief reference will be made at this time. Dr. Joseph Jones, in describing a mound opposite the city of Nashville, says, "This stone grave, which was about two feet beneath the surface, had been constructed with such care that little or no earth had fallen in, and the skeleton rested, as it were, in a perfect vault." According to Professor Thomas, the fact that this grave was unfilled with earth would indicate that the 'corpse' was a modern plant, placed there for purposes of deception.

Professor Thomas then cites, as a witness against us, one of our own members, a Mr. A. S. Tiffany. It is therefore proper to state that this venerable gentleman has a grievance against the academy. During the preparations of its first volume of Proceedings, Mr. Tiffany presented for publication a geological paper containing a list of the fossils found in this vicinity, which, after careful examination, was, for good and sufficient reasons, declined. This so offended him that he withdrew from active participation in its proceedings, and ever since has never missed an opportunity to defame his old associates, and denounce its management. It is only necessary to add that he is not an archeologist, was not present at the discovery of the tablet, never examined the mound from which it was taken, and hence his mere opinion can have no scientific value.

Nevertheless, Professor Thomas makes this secret letter of Mr. Tiffany's the corner-stone of his argument. As I have before me a copy of this letter, received through the courtesy of Professor Thomas, I speak advisedly when I state that the quotation used by him is not correctly given. There are in it no less than four alterations of the text. The original indicates illiteracy, whereas the quotation as given by Professor Thomas has all the polish of his own excellent composition. Professor Thomas, moreover, seeks to create the impression, that, inasmuch as Mr. Tiffany was a prominent and active member of our academy, therefore his opinions as stated in this letter should be received as authority; and yet, strange to say, in the very last sentence of this same letter, Mr. Tiffany announced his separation from the academy, and his determination to have nothing more to do with it. Nor is this all. In this identical letter, Mr. Tiffany wrote as follows concerning the shale tablets: "Those shale tablets, I have the utmost confidence that they are genuine. I examined the situation when they were first obtained." Mr. Tiffany never examined the mound from which the limestone tablet was taken, but still he is 'certain' it is a fraud: this Professor Thomas quotes. Mr. Tiffany did examine the mound from which the shale tablets were taken, and pronounces them genuine: this Professor Thomas omits. I am therefore compelled to pronounce the use made of this letter by Professor Thomas as unfair, and his quotations from it as garbled. I would not willingly do him any injustice, and hence now call upon him to publish this letter *verbatim et literatim*. If he will have a facsimile of it prepared by photograph or any other process, and furnished to *Science* for publication, I am prepared to say that such publication would not only destroy its value as authority, but would subject Professor Thomas himself to censure in resorting to such sources for scientific material. To facilitate such publication, I will add, that, if it involves expense not properly belonging to the bureau, I will engage to deposit with the editor of *Science* the necessary amount to meet it. I am of course unable to make any such publication myself, inasmuch as the original letter is in the possession of Professor Thomas, and no copy can do it justice.

Before closing this paper I desire to add a few observations concerning the shale tablets. In order to secure a thorough investigation of their merits, they were sent, soon after their discovery, to the Smithsonian institution, where they remained during a session of the national academy, and were then inspected by its members. In a letter bearing date April 11, 1877, Prof. Spencer F. Baird, secretary of the Smithsonian institution, in acknowledging the receipt of the tablets, said of them, "There seems every indication of genuineness in the specimens, and the discovery is certainly one of very high interest;" and after a more careful inspection of them, and their exhibition to the members of the national academy, the tablets were returned to Davenport; and in his letter bearing date May 31, 1877, Professor Baird thus states his conclusions thereon: "Most of the persons who examined them, among whom were Professor Haldemann, Mr. Lewis H. Morgan, and others, were of the opinion that they were unquestionably of great antiquity, the absolute period of which could not, of course, be measured. The similarity in the weathering of the inscriptions to that of the rest of the tablets gave them this impression." With this favorable indorsement of such men as Prof. Spencer F. Baird, Professor Haldemann, and Lewis H. Morgan, the Davenport academy felt secure in the position it had assumed, and thereupon published its discovery to the scientific world.

In a recent correspondence with Professor Thomas, I learned of his intention to write these papers against the authenticity of the relics in question, and I then submitted to him that it would be manifestly unfair to do so without some previous investigation. I even brought the matter before our academy, and had this resolution adopted, and personally transmitted the same to Professor Thomas at Washington: —

"Whereas the correspondence of Prof. Cyrus Thomas with President Charles E. Putnam has been submitted to the academy, therefore be it resolved, that the academy extends a cordial invitation to Prof. Cyrus Thomas, previous to his proposed publication, to visit its museum, inspect the relics under discussion in the correspondence, examine the mounds where they were discovered, interview the finders, and investigate all available evidence."

This invitation certainly indicated confidence in the genuineness of our relics, and our willingness to have them subjected to the most searching scrutiny. The invitation, however, was, on behalf of the bureau, curtly declined, and on the part of Professor Thomas indefinitely postponed. Apparently our Washington friends are so anxious to condemn, they are afraid to investigate.

CHARLES E. PUTNAM,
President Davenport academy of sciences.
Davenport, Io., Jan. 15.

Topographical models or relief-maps.

In Nos. 153 and 154 of *Science*, reference is made to the use of exaggerated vertical scales in the construction of relief-maps or topographical models; and, as you have been good enough to refer to a piece of work in this line done by myself and wife, — but which is as yet private property in my study, and not

upon the market, as might be inferred from your criticism, — I trust I may be allowed a word relating thereto.

There are various uses for topographical models, and that for which they are designed must necessarily govern their construction. While the technical geologist, in considering orographic questions, finds it undesirable to exaggerate the vertical scale of his cross-sections, such profiles would be absolutely useless in the actual construction of a railroad. It should be equally evident that the needs of school-children under sixteen years, and those of the field geologist, are not necessarily met by identical appliances. The construction of suitable topographical models for use in the common schools is educationally of the utmost importance, and, now that the matter has been referred to, I hope it may receive the consideration it demands. Almost every great physiographic and commercial problem requires the pupil to see his locality and state in its vertical relations to other states and countries; and how best to enable him to do this, is not solved by Professor Lesley's dictum.

What we need to-day for educational purposes, as I see it, is an accurate topographic model of every state in the union, constructed in such proportions as will enable the pupils, in their respective schools, to use it as a working-plan for the making of a larger model of their state. This map should not be isolated. The pupil must see it in its horizontal and vertical relationships to other states. Now, to meet these demands, a relief-map of the United States is required, in which both the horizontal and vertical elements for each state may be measured with sufficient accuracy and facility by the pupil. Such a model must be portable, very strong, and *extremely cheap*. I emphasize the last, because, unless they are cheap, the schools needing them most cannot have them. Now, a model of the United States might be constructed, as Professor Lesley suggests, but it would be useless for topographic purposes if made of any portable size. Our own map has the horizontal scale sixty-five miles to the inch, and it is certainly as large as can be conveniently handled in the average school-room. But taking the Grand Cañon district as an example of what might be done with both scales alike, using Mr. Dutton's profile, extending from the Markagunt plateau southward across the Grand Cañon, for data, we should have the following profile: —

1. Markagunt plateau	10,568	feet	above sea-level,		or	.0295	inch.
2. North bank of Parunuweap	4,659	"	below (1)	"	"	.0138	"
3. Depth of bed of stream...	1,250	"	" (2)	"	"	.0036	"
4. Height of Vermillion Cliffs	1,818	"	above (2)	"	"	.0053	"
5. Foot of Vermillion Cliffs..	1,363	"	be ow (4)	"	"	.0040	"
6. Brink of Permian terrace.	1,022	"	above (5)	"	"	.0030	"
7. Foot of cliff.....	568	"	below (6)	"	"	.0016	"
8. Brink of second terrace....	1,022	"	above (7)	"	"	.0030	"
9. Foot of second terrace.....	1,931	"	below (8)	"	"	.0057	"
10. Brink of Grand Canon....	113	"	above (9)	"	"	.0004	"
11. Bed of Colorado.....	1,363	"	below (10)	"	"	.0040	"

These figures are a sufficient proof of the impracticability of making a model of any large section of country without exaggerating the vertical scale, to say nothing of cheaply reproducing it with any degree of accuracy. Our map, constructed with the horizontal scale 5,000 feet to the inch, that is, the same as the vertical, would be about 16 rods long and 9 rods wide. Were it constructed with the vertical scale the same as the horizontal, Mount Whitney would be but .044 of an inch high; Mount Washington, .018 of an inch; and the highest point in Wisconsin, .0053 of an inch. Our model has attached to it one of the summits of the White Mountains, both scales alike, covering a rectangle 9 by 5 inches, and shows in itself just what the effect of exaggeration is. For my part, when I think of a mountain valley represented on the model, I think of it as 65 times wider than it is in the model; and I believe that pupils, if properly taught, will do so. F. H. KING.

River Falls, Wis.

A national university.

The issue of *Science* for Dec. 11, 1885, contains an article on 'A national university,' with such reference to my connection with the action of the National educational association on this subject, some years ago, as may be thought to demand my attention.

In so far as the article in question deals with the National educational association and its committee on a national university, it is almost wholly devoid of truth, as I proceed to show, with such fulness as a reasonable allotment of space will allow.

1. How does the author of that article know "there is no evidence that the committee ever did any active work"? The assertion is a bold one, untempered by any qualification whatever. And yet the chairman of that committee, having first sought to bring the originator of this and other misrepresentations before the bar of the national association, at Detroit, in 1874, that he might then and there be openly confuted, himself appeared with proof that a large amount of work, in conference, by correspondence, and by the repeated printing and circulation of successive draughts of a bill, had been done by it, all through a period of years.

2. There is equal falsity in the statement that "Dr. Hoyt, although chairman of the committee of the national association, had never been able to get that committee together, and it [the bill] was therefore essentially a bill presented by a private citizen." Probably there never was a meeting of any committee, composed, as this was, of members from each and every state in the union, at which every member was present; but to say, on this account, that a committee, many of whose members had repeatedly conferred with each other on the subject assigned them, never had a meeting, would be a use of terms of which no reasonable person would approve. As a matter of fact, the members of the committee who attended the sessions of the association during the years in question conferred with each other; while all of the members were repeatedly communicated with, and had a voice in the matter under consideration, as truly as though every one had been present at the meetings. Moreover, every report of the committee so agreed upon by conference and correspondence, and presented to the association, was adopted by that great body without one dissenting voice. And, as for the bill at length presented to congress, it was as truly matured by the committee as any bill was ever matured by any committee; for the three successive tentative draughts of it, each embodying some new amendment or amendments, generally concurred in, were severally sent to every member of the committee, for renewed consideration. More than this, copies of the bill, as amended from time to time, were also sent to a large number of other learned gentlemen and statesmen throughout the land, for their criticism and suggestions.

While, therefore, the bill was drawn by the chair-