heavy rain the 14th and 15th, and on the 16th records 'rain about every P.M. this summer.'

The remarkable gust of rain and wind that wrecked the long bridge over the Connecticut River, and many fine elms there and in Hadley, June 14, 1877, began as the usual darkening of more or less general and ordinary cumulo-stratus at the same centre near Williamsburg. It seemed hardly moving, with a slight sheet of rain, for a while, and then I noticed its rather rapid increase of size and motion. It expanded south-east, in shape like a ploughshare, and its accelerated movement down the hill-slopes toward Northampton became exciting to witness. There was nothing like a downward-reaching funnel; but the whole rain-cloud was near to the earth, and, for a while before reaching the river-bridge, there were, in front of the cloud, wisps of cloud that moved rapidly upward, backward, and downward, as if around a horizontal axis. After passing Hadley, it exhibited no features different from a common rain-cloud, and passed off over the Holyoke range.

Files of signal-service weather-maps may be consulted for the days above mentioned; and citizens of Northampton may recall enough to show whence the tornado came on the evening of Sept. 4, 1873. The hotel on Mount Holyoke would be an excellent post of observation to exactly locate and watch the cloud-intensifying spot above described.

H. W. PARKER.

Grinnell, Io.

Tadpoles in winter.

A few days ago one of my students brought me three large tadpoles, seven centimetres in length, from a well in a depression in an open field. The well overflows in the spring of the year, and the water this winter has been quite cold, yet the tadpoles do not seem torpid at all, but swim freely about.

I had always supposed that these animals could only live in the warmer months of the year, and would like to know if any readers of *Science* have ever found them alive during the winter.

H. M. HILL.

Watertown, N.Y., Jan. 30.

A monument to de Saussure.

The month of August, 1887, is the centenary of the ascent of Mont Blanc by de Saussure, the first to accomplish it after Jacques Balmont, the guide, whose success of the previous year had been stimulated by de Saussure's offer of a prize for the discovery of a practicable route.

The commune of Chamonix, with the co-operation of the French alpine club and others, proposes to erect a monument to the eminent geologist, physicist, and explorer. American contributions toward this object will show our appreciation of the character of the man, and the value of his work.

The Appalachian mountain club, in response to solicitation from the French society, will take pleasure in transmitting donations, which may be sent to the corresponding secretary, Prof. Charles E. Fay, at the club-room. Owing to delay in receiving the invitation, replies must be immediate, as the lists are open abroad only until the close of the present month.

J. RAYNER EDMANDS,
President.

The Appalachian mountain club,
7 Park Street, Boston, Mass., Feb. 2.

The Davenport tablets.

In the issues of your journal for Dec. 25 and Jan. 1, Rev. Cyrus Thomas, of the Bureau of ethnology, directs attention to the Davenport tablets, and seriously questions their authenticity. In entering upon this undertaking, Professor Thomas stated, that, to properly discuss the question of their genuineness, "a personal inspection of the relics, and a thorough investigation of all the circumstances attending their discovery, should be made;" and then he added, "I do not claim to be thus prepared." Probably no writer ever before set out to prepare a piece of 'destructive criticism' with so frank a confession of his disqualification for the task.

In his arraignment of our relics, Professor Thomas charges upon them these grave offences: that on the limestone tablet the sun is represented with a face, and that the artist has carved thereon the 'Arabic 8' and the 'Roman numerals viii;' that on the shale tablets there are also 'three Arabic 8's;' that nearly all of the letter characters of the 'cremation scene' may be found on p. 1766 of Webster's Unabridged dictionary, edition of 1872; and that the two forms of the 'Gallic *O*' appear together on the tablet just as given on the page of the dictionary. These are fair specimens of the arguments by which Professor Thomas attempts to controvert the unimpeached statements of the discoverers. The resemblances indicated are so trivial and purely fanciful as to scarcely attain the level of serious criticism. If Professor Thomas will take the Grave Creek tablet, or even the famous Rosetta stone, and sit down before them with his 'Webster's Unabridged,' he will find no end of similar resemblances. A single glance, for instance, at the Grave Creek tablet will reveal the 'Arabic 4,' twice repeated, and he will find his arguments equally forcible if applied to it. In answer to the accusation that the sun appears with a face, it may be said that this is not uncommon in Indian pictography.

In his impeachment of the limestone tablet, Professor Thomas then advances this argument: "The simple fact that the vault under the pile of loose stones was empty, save the presence of the relic, appears to absolutely forbid the idea of age. It is well known to all who have taken any part in excavating, that the water running down through earth, and a pile of stones beneath, will at length fill all the crevices with earth, and, in fact, all places not hermetically sealed."

It will be noticed that Professor Thomas speaks of this limestone tablet being 'under a pile of loose stones,' which is an inaccurate statement, inasmuch as the vault wherein it was placed was entirely covered by a limestone slab, now in the museum of the academy. Therefore, so far as any direct descent of water was concerned, this vault was practically 'hermetically sealed.' If water entered at all, it must have been horizontally through the wall of loose stones at the sides. The crevices in this wall were filled with decayed shells, and, as most of the water falling upon a mound would pass off on the surface, the small amount of moisture absorbed into its substance would not 'run down through the earth' at all, but instead would slowly percolate from grain to grain of sand or clay, which, having no current like 'running water,' could transport little or no earth. Apparently no good reason can be given why a vault so protected from above, as well as at the sides, could not remain empty for ages.

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