elevate, rather than cater to, the present standard of physical instruction in the schools. W.

[The 'master mind' was distinctly recognized, and its presence cheerfully acknowledged, in the review to which the above refers. The reviewer heartily joins his critic in his desire for a 'closer examination' to determine the justice of the comments made. Such an examination will unquestionably show that every criticism made in the review is well founded. It will be generally admitted that an explanation which needs explaining is not extremely satisfactory. The points under discussion are such as are not usually considered in books with which the teacher is likely to be familiar; and erroneous and confusing statements will generally be accepted, although not understood. The result must be disheartening, if not disastrous. It seems wiser, therefore, to warn him to be on the lookout for errors which have not been eliminated from this first edition, but which are not likely to be found in a second. And this is especially true of a book which contains as many really good and original things as the 'New physics,' and which carries the weight which naturally and necessarily goes with any thing Professor Trowbridge writes. — REV.]

The earthquake of Jan. 2.

Supposing that reasonably exact determinations of the time and character of seismic phenomena are useful, I send the following note on the shock of Jan. 2 at Washington.

I recognized the character of the shock at the instant of its occurrence, and timed it. On the following day, comparing my watch with one set to the standard (not local) time adopted for this city, I found the shock occurred at 9 h. 16 m. P.M., civil time, to which the correction to the Washington meridian is to be applied. My residence is close to Ascension church, on the highest land away from the boundaries of the city: the grade is ninety-two feet above mean level of the river, and two feet higher than the base of the capitol. I was in the third-story back room, facing east into the back-yard, and south into an alley. The house is of brick, and above the middle of the second story is isolated. The shock was a distinct and very heavy and sudden jar, not accompanied by noise, unless by a slight rattling of the windows, and lasted less than a second. The sensation was as if a very heavy body had struck the earth, yet also as if the jar were partly upward rather than downward. There was no second shock within fifteen minutes, although I saw a paragraph in the daily press to the effect that one individual alleges that he felt a second shock about 11 P.M. at Alexandria, Va. W. H. DALL.

Itinerant science-teachers.

In *Nature* for Dec. 25, 1884, there is described an 'itinerant method of science-teaching,' which "has been carried out on a large scale and with the most gratifying success by the school boards of Birmingham and Liverpool." A science demonstrator is appointed for a number of schools; and he is provided with apparatus, which is conveyed from school to school in a handcart 'by a strong youth.'

"The system," it is said, "fairly meets the objections which have been urged against the introduction of science-teaching, on the grounds of want of qualified teachers, want of time [to prepare for the lessons], and cost of apparatus. It also secures systematic and continuous teaching throughout the school-year. The teaching is practical, and every fact or law is demonstrated experimentally."

Would it not be well to try a similar plan here?

J. R. W.

[It would answer in large centres, but would be limited in its application to places where it might be said to be least needed. — ED.]

The voice of serpents.

The text-books upon zoölogy represent that the vocal apparatus of serpents is very scantily developed, only enough to enable some of these creatures to hiss. A fact lately brought to my attention by Mr. George W. Leitch of Ryegate, Vt., is worthy of mention, and may lead herpetologists to search more carefully for the vocal apparatus of serpents. Mr. Leitch was stationed for several years at Manepy, Ceylon, as a missionary of the American board of commissioners for foreign missions. One day a serpent entered an apartment containing lumber, and it was deemed best to kill him. It became very angry, and made a loud noise, which Mr. Leitch says reminded him of the bellowing of a bull two years old. Perhaps others may know of instances in which these creatures make loud noises. This animal was of an uncommon variety, and was not preserved. It was of considerable size, say, seven or eight feet in length.

C. H. HITCHCOCK.

Hanover, N.H., Jan. 16.

The incandescent light on steamers.

In No. 102 of *Science*, in the article on 'Recent advances in electrical science,' Professor Trowbridge makes the statement that the Fall-River line took the initiative in adopting the incandescent system. This is certainly a mistake, as I myself saw it in full operation on the Virginia, of the Bay line (running between Baltimore and Norfolk), in the autumn of 1882, about a year before the Pilgrim was launched. Whether the Bay line was the first to adopt it or not, I do not know.

EVERETT HAYDEN.

U.S. geol. surv., Washington, D.C., Jan. 19.

Rainfall and crops.

Professor Snow's statement (*Science*, v. p. 13), that an annual rainfall of eighteen inches is entirely inadequate to maintain successful agriculture, is, I suppose, meant to apply only to Kansas, and, with that limitation, may be correct. In California, and especially in this portion of it, our experience is very different. Properly distributed, a rainfall of ten inches is ample to mature the cereals, and excellent crops are frequently raised with less. In the season of 1881–82 this place had 4.89 inches of rain, and there was an almost complete failure of crops, except on irrigated land. In 1882–83 there were 5.86 inches; and the distribution could hardly have been worse, almost all the rain falling after the 26th of March. Even under such circumstances there was some production on dry land, and the opinion was general that the crops would have been fair if the same amount of rain had come at the proper times. Last year the rainfall was almost unprecedented, reaching 18.32 inches. It was altogether too much. The crops were good, but they would have been far better if the last inch or two had been omitted. Of course, under different conditions of soil and climate,

eighteen inches may be too little; but here an assured minimum of ten, or even eight inches, would rob farming of all its terrors.

S. E. Moffett.

Kingsburg, Fresno county, Cal., Jan. 13.

The use of slips in scientific correspondence

To find that different workers have independently reached the same conclusions, or that they have adopted the same expedients to facilitate their work, is an evidence of the justness of the conclusions, or the excellence of the expedients. This reflection is suggested by the perusal of Professor Wilder's note of above title in *Science* of 16th inst., p. 44. At the time (May 15, 1867) when Professor Wilder announced to the Boston society of natural history his use of slip-notes, I remarked that I had used slips in a similar manner; and now I can say that my principal colleague in the editorship of *Psyche*, Dr. George Dimmock, has for a long time exchanged with me, and probably with others, correspondence-slips for purposes similar to those described by Professor Wilder, and that I have used the card-catalogue system with profit for all the purposes mentioned by Professor Wilder and for others.

The essential features of slip-systems for filing away notes are the use of a standard or uniform size of paper for all purposes, and the entry of but one subject on a slip. After many and various experiments in the attempt to combine these features with others which are desirable, I have found the following arrangement the most convenient for all files which are not kept as card-catalogues purely. I procure thin manila sheets, 23 by 15 centimetres, or about 9 by 6 inches, which are perforated with a cutting-punch near the left margin, at distances of 13.5 centimetres from the right margin, and 2.5, 7.5, 16, and 21 centimetres from the lower edge.[1] Any number of these can be bound together by shaking them into place, and passing a twine or thread through the perforations, which all correspond. Slips, of whatever size or shape, not exceeding 23 by 13.5 centimetres in size, can be lightly attached to the right-hand pages by mucilage on two or more corners of the slip. These can be extended, rewritten, or removed, without removing the sheets to which they are attached. The whole of the left-hand page serves for catch-words, classificatory headings and sub-headings, or whatever matter of similar character may be desired, referring to the reverse of the page. New leaves can be inserted, or old ones removed; in a short time, while at all times the notes have the advantage of being in book form, and free from the dangers of accidental displacement, as, for instance, by a gust of wind, or by dropping the package. For rapidity and ease of reference, I know of no better system. The removal of slips from envelopes, and replacing them, take a great deal of time; and the keeping of slips in card-catalogue form prevents a rapid survey of the material in hand. If it is desired to spread the whole material out on one surface, the strings can be withdrawn from the leaves.

The same manila sheets can be used for mounting newspaper scraps for permanent preservation; and pamphlets, circulars, etc., can be perforated with corresponding holes, so that all may be tied together in any sequence desired, and temporary covers, similarly perforated, may be placed on each brochure.

B. Pickman Mann.

Washington, D.C., Jan. 19, 1885.

[1] For an article by me on standard holes for temporary binding, see *Library journal*, January, 1883, vol. viii. pp. 6, 7.

THE DECADENCE OF SCIENCE ABOUT BOSTON.

A Bostonian, proud of the scientific fame of his native place, and yet only too familiar with empty benches at the ordinary scientific assemblages, and to whom the election of new members, 'postponed for want of a quorum,' is a standard event, when he visits Baltimore and Washington, begins to ask whether the sceptre has not departed from Israel. He is thereafter a little shy about inviting a brother physicist from Baltimore to attend a meeting of the academy, or taking a naturalist from Washington into a session of the natural history society. To a friend about to visit the national capital, he unburdens himself with sad forebodings of the decadence of science at home; but 'tell it not in Gath,' he whispers as he parts. Nevertheless, it is an open secret.

The actual state of things is simply this, — that the meetings of scientific societies at Washington and at Baltimore are much more numerous and more specialized than at Boston and Cambridge, and present at nearly every session a more varied and interesting assortment of papers, which receive wider and freer discussion at the hands of much larger audiences. So far as interest and attendance go, the meeting in the southern city is what it formerly was in the northern; and it is a pleasant and yet sad reminiscence of earlier and better days for a scientific man from Massachusetts to visit his confreres at the south. He sees again the freshness and eagerness he was wont to see at home. The audience does not sit around the rear door, hat in hand.

It is not easy to see the exact reason for all this changed aspect of affairs in the north. Assuredly, never was more expected of science than at the present day. All men attend her words. Is it that each specialist has become so engrossed in the little corner of the universe he cultivates that he can scarcely see beyond that corner, and must needs keep to it even when he shows its products? Yet why should one's mental horizon be narrower at Boston