of be the time required by the front of a ray in moving from n to m, or *vice versa*. During the first interval let x and z' alone be open. The rays between the screens at the conclusion of the first interval are shown in the first diagram. During the second interval let y alone be open, and let the reflector at y' send the ray impinging on it towards z. The situation of the rays at the end of the second interval are shown in the second diagram. During the third interval let x' and z alone be open. The rays between the screens at the end of this interval are represented in the third diagram. During the fourth interval let y' alone be open, and let the reflector at y send the ray from that point toward z'. The next interval is a repetition of the first, and so on.

It is seen that, in fact, the difference in the directions of the two rays arriving at B can be made less than any assigned finite angle, however small, by sufficiently increasing the distance between the screens, or sufficiently decreasing the space between the openings, or both.

It is possible that the above process may, from its comparative simplicity, conduce to a clearer understanding of the relations involved, though it seems inferior to the one originally proposed in some important particulars. H. T. EDDY.

University of Cincinnati, Feb. 2, 1884.

The Greely relief expedition.

In view of the comment upon the Greely relief expedition, it may not be out of place at this early date to call attention to a neglected principle of arctic navigation which bears with full force upon the navigation of the route in question. To its adoption may be traced the success of Nares with the Alert and Discovery, and of Nordenskiöld with the Vega; to its neglect, the wreck of the Jeannette and the Proteus among a host of others.

Simply stated, it is, under all circumstances, to cling to the coast, and among its islands find protection against the floating ice. To coast along the edge of the floe, and follow the openings it offers, is a veritable siren. Of course, the principle is not applicable till after Jones's Sound is passed; but here the course is usually free.

The Eskimo knew me as TILITOIANIAC.

New Haven, Conn., Feb. 2.

The red skies.

I have only time to-day to reply very briefly to your editorial inquiry on p. 30, as to previous instances of red skies and volcanic eruptions.

You will find a West India instance in 1831 on p. 165 of the *Meteorological magazine* for 1883; but the most striking parallel has been pointed out by Professor Karsten of Kiel as occurring in 1783, lasting about four months, and spreading over the whole of Europe, northern Africa, and eastern Asia.

Arrangements are being made for the concentration of all collectible information upon the subject, and I shall be proud to act as the receiver of copies of any notes or records which your readers may intrust to me. G. J. SYMONS, F.R.S.

62 Camden Sq., London, N.W.,
Jan. 25, 1884.

[We shall publish Professor Karsten's article next week.]

Aeolian ripple-marks.

On the evening of June 11, 1883, after a severe rain-storm, during which large quantities of soil were washed from adjacent fields and deposited along the roadside, I noticed near Brodhead, Wis., a peculiar phenomenon, which may be worth recording. The mud, deposited only a few hours before, was still very mobile, and, at the point where best seen, covered an area a rod or more wide and three or four long, presenting a perfectly plane surface. The steady force of the strong wind was interrupted by occasional gusts of greater violence, each of which raised on the plastic mud-surface corrugations, which, in every detail that could be caught during their momentary existence, resembled ripple-marks formed by water, being a beautiful and distinct series of parallel ridges slightly concave toward the direction of the moulding-force. The outlines of these aeolian ripples were no sooner defined than they began to dissolve, and a minute or two sufficed to obliterate all trace of them. The phenomenon was observed several times on the same surface, and also in adjacent localities, where the consistence of the mud, and therefore the duration of the ridges, varied slightly. The ripples were best defined in the thinnest mud, though this was most favorably situated for their production; and they disappeared less rapidly where formed in the more viscous material.

This, of course, is not a radically new phenomenon, but a rare phase of the familiar action of wind on liquid surfaces. R. D. SALISBURY.

Winchell's 'World-life.'

Will you permit me to announce that a number of errata, attributable both to author and proof-reader, have found their way into my late work on 'World-life;' and I will be glad to mail slips of corrections to any who will kindly notify me by simple postal-card that they so desire?

ALEXANDER WINCHELL.

Ann Arbor, Mich.

THE LABORATORY IN MODERN SCIENCE.

THE material circumstances under which scientific discovery is prosecuted have been completely revolutionized during the last forty years. Of the immense changes that have occurred, the majority have fallen within the last fifteen, one might almost say dozen, years. It is interesting and profitable to contrast the past with the present in this respect.

Forty years ago there were very few, more properly no laboratories which we of to-day would consider even tolerable. Now every university of importance and high repute, the world over, has large suites of rooms for each department of science, and often numerous great buildings within whose walls thousands and thousands of students are daily brought face to face with the facts and laws of nature. The generation that is now gone pursued its scientific studies in incommodious quarters, and even those were destined for the use of the professors rather than the students. Many a small, dingy, and ill-lighted room is still to be seen, where some illustrious *savant* created new knowledge,— a small square chamber, with crooked walls, low ceiling, undulating floor,