This color gradually formed a uniform sediment of an indefinite tint over the bottom of the basin. On the night of the 26th of December last, which was an unusually cold one for this climate, the water in the basin froze. On the melting of the ice the next day, the beautiful figure you see on the photographs was left in the sediment. I carefully poured the water from the basin, let the sediment dry, and thus perfectly preserved the figure. It has been accurately photographed by an artist in this city. The negative is preserved; and, if you would like to have any more copies, they can readily be obtained.

"'We are not much accustomed, in this warm country of ours, to the beautiful 'forms of water;' and this has struck me as a little remarkable, and worthy of being kept.'

"The fact that the results have been produced by colored sediment indicates a method of exhibiting the effects of crystallization in an interesting manner."

Professor Tyndall refers to this as a 'surprising case of crystallization,' which it most certainly is.

Some years ago a glass-crystallizing dish was filled with Ohio-river water, which at certain stages carries in suspension a large quantity of yellow clay, and allowed to settle for several days, forming a thin yet firm deposit on the bottom of the dish. During a very cold night the water in the dish was frozen, and the sediment figured as herewith represented. The ice was melted, water removed, and the sediment dried. I have this remarkable specimen in my possession to-day, just as it was originally formed.

FIG. 2.

WM. L. DUDLEY.

Cincinnati, O.

An open polar sea.

In one of your September numbers (No. 86), there was a letter from Lieut. Ray on this subject, which, I think, needs some elucidation. Mr. Ray questions the existence of an open polar sea, on account of the low temperature of the water found by the last American polar expedition. What has the temperature of water to do with its greater or less freedom from ice in arctic climates? The temperature of maximum density of sea-water being lower than the freezing-point, the formation of sea-water ice is impeded, as the colder water is not the lighter. If, however, ice forms on sea-water, it is because, 1°, the specific gravity near the freezing-point differs much less (about one-third as much) from degree to degree than near 70°; so colder water has not so strong a tendency to arrange itself according to specific gravity as warm water, and may freeze, especially with cold winds from the land; 2°, at the close of summer the upper layers are generally much less salt than the lower, on account of the fresh water coming from melting ice, and from rivers swelled by the melting snow (this is especially the case in many inland seas of the northern hemisphere, and to a less degree in the southern hemisphere; such an arrangement of the waters allows the upper strata to be colder and yet lighter, and thus is very favorable to the formation of ice); 3°, after ice begins to form, it increases both from below, on account of the cold penetrating the ice, and from above, on account of the freezing of waves, spray, etc., on the surface of the ice.

Now, when the second condition, the most powerful (at least, for the beginning of the formation of sea-ice), is absent, or present only in a small degree, the conditions for the formation of field-ice or sea-ice are lacking, or only present on a small scale. This is more often the case in the high latitudes of the southern hemisphere than in the northern; because in the southern the seas are deeper and more open, and receive little river-water, the temperature of the air and sea is below the freezing-point to about 62° south, and the icebergs reach that latitude without melting.

If the north pole is surrounded by open, deep water, and if the temperature of summer there is lower than at the stations where observations have been made in the northern hemisphere (both suppositions will be granted as possible), there do not exist conditions so favorable for the formation of field-ice as on the north coast of Asia and North America, as there will be no brackish water of a low specific gravity near the surface. Thus there may be relatively open water near the north pole, not warm,

but cold; this only on the supposition of a deep, broad expanse of sea. If not, — if the pole is surrounded by a cluster of islands, like the archipelago of North America, — ice must predominate there, yet probably not so as to entirely exclude patches of open water, since these have been found everywhere in the Arctic.

Mr. Ray does not entertain the idea of a 'polar ice-cap,' — an idea which, unfortunately, lurks in so many heads that should know better (by ice-cap I mean one of great depth and permanence, formed on the open sea, not glacier ice). Mr. Ray's letter led me to look over the controversy on 'geological climates' in *Nature*, 1880–81. The polar ice-cap hypothesis was warmly advocated by Professor Samuel Haughton, who is, I think, considered an authority on this subject, at least in Great Britain. It was not abandoned by him, notwithstanding the strong arguments brought against it, especially by Mr. A. R. Wallace. A. WOEIKOF.

St. Petersburg, Oct. 29.

Rhyssa not lignivorous.

In the record of the proceedings of the Brooklyn entomologial society, as reported in *Science* of Nov. 7, Mr. George Gade denies the parasitic nature of Rhyssa lunator, and states that it is a wood-feeder. This conclusion was indorsed by at least two other members of the society at the meeting of Sept. 27, and without any protest. The conclusion is quite erroneous; for not only does the whole organization of this genus of our largest ichneumon-flies point unmistakably to its parasitic nature, but there is plenty of evidence by competent observers on record to corroborate it.

Let me add, that I have had ocular evidence of the fact, as I have in a number of instances taken the Rhyssa larva of various ages and sizes, feeding upon the larva of Tremex columba. The Rhyssa does not sting and oviposit in its victim, however, as is generally supposed, but lays its egg anywhere in the Tremex burrow. The Rhyssa larva seeks its victim, and fastens to it from the outside, and thus develops, as do so many other parasitic larvae. This trait will account for Mr. Gade's observation upon which he based the erroneous conclusion. C. V. RILEY.

Washington, D.C.

Sky-glows.

Several letters in recent numbers of *Nature*, on 'sky-glows,' have reminded me of some observations made last summer during a trip across the Sierra Madre Mountains from Parral to Guadalupe y Calvo, in the state of Chihuahua, Mexico, which may be of interest to the readers of *Science*. The following account of the phenomenon is taken from my note-book under date of June 24, 1884: —

About nine o'clock this morning, as we neared the top of the mountain above San Estavan, at an elevation of 8,900 feet, Col. Matlock, my travelling companion, called attention to the remarkable dimness of the sunlight, suggesting the approach of rain or an eclipse of the sun, as no clouds were to be seen. On looking towards the sun, a peculiar pinkish glow, shading into purple, surrounded it, extending from fifteen to twenty degrees. The remainder of the sky presented a dark-blue, leaden color. The sunlight was so obscured as to give a peculiarly sharp outline to the shadows cast by the trees, and a weird appearance to the landscape. The glow continued throughout the day, which was perfectly clear with the exception of a few small fleecy clouds about noon, that flitted across the sky from the south-west.

We camped at Cuevas Blancas, on a small creek, a little before sunset, at an elevation, as indicated by a small aneroid barometer, of 9,190 feet. A huge rock, unfortunately, shut out the sun as it set; but on one side could be seen the new moon and two planets — Jupiter and Venus — shining with a bright silvery lustre through the pinkish hue of the sun-glow. As the twilight faded away, the color changed to a pale red. The sky at the time was perfectly clear, and the stars came out beautifully. According to my watch, the sun set at quarter-past seven o'clock, and the glow did not entirely disappear until half-past eight.

Wednesday, June 25; the same appearance of a pinkish or salmon-colored glow surrounded the sun as on yesterday, though the sunlight was apparently not so much obscured.

I may add, that a similar glow, though not so marked in appearance, was observed for a week or ten days thereafter. The rainy season, which usually begins in the mountains by the middle of June, had not commenced at the time; and, indeed, there was very little rain up to the last of July, when I left the mountains. N. T. LUPTON.

Vanderbilt university, Nov. 17.

Iroquois grammar.

The assumption of 'Reporter,' that the conclusions of my Montreal paper can affect the value of missionary work, except in illustrating its difficulties, I deny. My critic's own statement, however, that the life and force of the language depend upon the meaning of certain pronouns, and that these must conform strictly to a system of grammar already prescribed, or render the version erroneous, does throw aspersions upon many valuable works.

That the early French missionaries did influence the language of the western Mohawks is evident from their use of words coined by those old fathers; but the statement that their translations conform to those of the east is incorrect.

As the most perfect and complete grammar yet written in the Mohawk has been in my possession for over two years, it has been an easy task for me to find, upon ninety pages scattered throughout Brant's prayer-book, over two hundred instances where the pronouns do not follow the system there prescribed.

In comparing two translations of St. Mark, executed at different localities, we find still greater differences, not only in pronouns, but in the tenses, number, etc. In one of these translations we find that "they that did eat of the loaves were five thousand *warriors*," and, in the thirteenth chapter, that 'those days' which in that chapter refer to the future are translated in the past. These are only a few of the instances which might be given to show the difficulties of those pioneers. When my critic says that the supposition of Indians writing for Indians, and writing incorrectly, is 'inadmissible,' he is the one to cast an undeserved reflection upon the venerable missionary reviser of Brant's prayer-book, who has made numerous changes in these pronouns.

Through the kindness of French missionaries, I have had access to archives rarely or never opened before, have been permitted to bring to my own home their erudite researches, and I have not been so ungracious or ungrateful as to underrate either them, their work, or influence. I refer my friends to the paper read before the American association for the advancement of science at Minneapolis.

Confessedly now and forever a 'beginner,'

ERMINNIE A. SMITH.