sical conditions, the climate, the fauna and flora alike forbid it, and this has not been done. Man lives in less hospitable regions now than when the Trenton gravel was laid down; the climate at the close of the glacial period was not more severe than that obtaining to-day in the Arctic circle. The reindeer, musk-ox, seal, and walrus sustain man to-day in Arctic America, and why should they not have done so in the Delaware valley, when a prominent feature of this fauna, as their bones in the gravel testify, they once were? There is an Arctic flora in existence now; so why not here in the distant long-ago of Glacial times; and forests, we know, can flourish at the very edge of a glacier.

This whole matter is not so exclusively a geological question as the votaries of that science declare. The archæologist has this surface soil and the sand and gravel beneath it clearly within the range of his domain, and he is no archæologist whose training falls short of ability to study intelligently the history of these superficial deposits.

As yet, concerning the gravel deposits of the Delaware valley, the geologists have merely put in a denial, which should not weigh against the careful researches of those who have given years to the study of this subject. What is needed in these overcrowded latter days is a proof that palæolithic man is an impossibility. When this is forthcoming, and not until then, will the student of early man in America haul down his flag.

As to the present controversy, here is the whole matter in a nutshell:—

I.

The stones are inspected,
And Holmes cries "rejected,
  They're nothing but Indian chips"
He glanced at the ground,
Truth, fancied he found,
  And homeward to Washington skips.

II.

They got there by chance
He saw at a glance
  And turned up his nose at the series;
"They've no other history,
I've solved the whole mystery,
  And to argue the point only wearies"

III.

But the gravel *is* old,
At least, so I'm told;
  "Halt, halt!" cries out W. J.,
"It may be very recent,
And it isn't quite decent,
  For me not to have my own way."

IV.

So dear W. J.
There is no more to say,
  Because you will never agree
That anything's truth
But what issues, forsooth,
  From Holmes or the brain of McGee.

CHARLES C. ABBOTT, M.D.

## Water Rattlesnake in Captivity.

IN your issue of Nov. 11, there was an interesting account by R. W. Jones of a rattlesnake that would not eat. I had the care, this year, of a water rattlesnake (*Crotalus adamanteus*), which, after some trouble, I persuaded to eat. It was sent from Florida to the Toronto Natural History Society, in September, 1891; and at first we intended to put him in a cellar for the winter, and let him hibernate; but I thought a warmer place would be more likely to suit him, and so leave was obtained from the authorities to keep him in a large conservatory at the horticultural gardens. He had a glass-sided case to live in, 3 feet long and 15 inches wide, and was himself about 3 feet long.

I put a bull-frog in with him one day, but he took no notice of it, beyond just touching it with the tip (or tips, to be quite correct) of his tongue. I then tried him with a brown rat (he had now been about three months without food); when he saw the rat he grew quite excited, and struck at him twice. I waited about half an hour, expecting the rat to die, but the bite seemed to have no effect, so I left the rat in the case. As this was a Saturday, I did not see him again until Monday, and I then found the rat still alive; but with a bad bite on the side of its head, and the snake had two holes, made by the rat's teeth, through its rattle. The gardener told me that they had a fierce battle on Sunday afternoon, but they now seemed each afraid of the other. I killed the rat, and left the body in the snake's case, but he would not eat it. I next put a white mouse in his case, but of this he took hardly any notice. About the end of March I shot two goldfinches, and placed the dead bodies in his case. On visiting him again in a day or so, I was delighted to find that one of the goldfinches had disappeared. After this I supplied him frequently with dead birds, and about once a month he condescended to eat; but the birds he eat were always small ones, such as goldfinches, chipping sparrows, and warblers; he never ate any as large as the English sparrow or purple finch, several of which I put in his case; and he never fed while any one was looking at him.

His rattle was permanently injured by the rat's attack, and ever after sounded only a feeble and subdued kind of alarm. He changed his skin once during the summer; and, after the change, the tints of the beautiful diamond pattern on his back were extremely bright and vivid.

I could not get him to feed at all after the beginning of August, and he died in October, 1892, having been in captivity for a little over a year, for the first six months of which he went entirely without food. I gave him a shower-bath occasionally, which he seemed to enjoy, and was, I think, more ready to feed after he had been well moistened in this way.

I have now another and larger specimen of this rattlesnake to take care of. It was received from Florida in October last, and is quartered for the winter in a very warm and comfortable green-house. He has not as yet eaten anything, but I may be able to send you, next year, some report as to how he behaves.

I. B. WILLIAMS.

Toronto, December.

## Intelligence in the Lower Orders.

SOMETHING over a year since a young lady of my acquaintance had an experience with a beetle, which, I think, showed a very marked degree of intelligence in the insect; and, as such instances are somewhat rare, I venture to send you an account of it.

This beetle was a specimen of *Pelidnota punctata* Linn., which was given to her in September. At first she kept it in a small box, feeding it with grass, leaves, and small pieces of fruits, such as peaches, pears, etc. Occasionally she would give it a drop of water to sip. It would sometimes bite a little out of a leaf, would eat the fruits, and would take water eagerly.

From the first she would take the insect in her fingers several times a day and stroke or caress it, also putting it to her lips and talking to it all the while she handled it. When she put it to her lips it would brush its antennæ over them with a gentle, caressing motion.

When she left her room she would shut the "buggie" up in its box. One day, about two weeks after she received it, she was called out suddenly and neglected this precaution. She was absent a considerable length of time, and when she returned the insect was not in its box nor anywhere to be seen. Fearing that she might injure it, she stood still and called "buggie, buggie," when it came crawling from its retreat toward her.

After this, she would frequently leave it free in the room when she went out, and when she returned, if the insect was not in sight, she would call it, and it would crawl or fly to her. As this was continued, it would more and more frequently fly to her instead of crawling, until at last it flew nearly every time it was called. When it came in this way, she would put it to her lips or to her nose, and the insect would appear to be pleased, moving its antennæ gently over her lips, or taking the end of her nose between them and touching it with a patting motion.

She kept it in her room in this way, at the hotel where she was spending the summer, until about the first of November. She then returned to her home some three hundred miles further south, taking the insect with her. Here she at first kept it in her chamber, but the nights being sometimes very cool, it would become torpid and not get lively again until afternoon. Thinking it too cool for "buggie" there, she removed it to the kitchen. As it still appeared more or less dormant, she put it on a cloth above the hot-water boiler. Here it revived somewhat, but was not very lively nor did it eat very much.

About the middle of December it fell to the floor accidentally, by which fall it was evidently injured, as after that time it would eat nothing, and no longer recognized the young lady. About a week later it died. B.

### Meteoric Shower.

THE well-known stream of meteors — the Andromedes or Bielids — overtook the earth on Wednesday, Nov. 23, 1892. At this observatory they were seen soon after sunset, and the fall was continued at a uniform rate until eleven hours, when their number in a given time was diminished by half. The display was at a maximum of magnificence between the hours of nine and ten. From 9 to 9.16, one hundred fell; from 9.35 to 9.46, one hundred; from 10.13 to 10.26, one hundred; and this rate was maintained nearly all the evening. Likely, three-fourths of all that came were seen, since the eye was held steadily on the radiant, which was in Andromeda, not far from Brooks's comet. Of course, the meteors were not connected with that body. The highest number seen at once was six, and they seemed to emerge from the same point. Two were almost as brilliant as Jupiter, and left trains. Perhaps one-tenth of all seen had trails. Their velocity was not great, as this stream overtakes the earth, instead of meeting it.

EDGAR L. LARKIN.

Knox College Observatory, Galesburg, Ill.

### Pseudoaurora.

IN *Science* for Dec. 2 (p. 318) there is an interesting note regarding a peculiar appearance simulating the aurora around electric lights in Minneapolis. The writer approached the city from the suburbs and noticed nothing till he had passed the gas lights, but as he approached an electric light he saw beams emanating from it, and these disappeared on passing the light. The air was full of frost particles, giving an appearance of light fog. These appearances were simply shadows cast upon the fog by projecting arms or objects in the beam from the light and had no connection with electricity. These rays may be seen at any time when there is smoke, light fog, or mist. The easiest way to see them is to stand directly under the light and look up. Another way is to approach the light from a distance of 300 feet with the iron support of the lamp hiding the bright light from the eye. Any little opacity in the globe will throw a shadow into the fog. Oftentimes these rays are very beautiful, especially when seen through the branches of a tree.

These shadows are really the same as the Brocken Spectre, about which so much has been written. See this journal for Sept. 27, 1889, for an explanation of the phenomenon. Also *American Meteorological Journal*, March, 1890, p. 515.

H. A. HAZEN.

Washington, D.C., Sept. 10.

### Brilliant Meteor.

ON the night of Nov. 29, about 8 o'clock, a very large meteor was seen passing westward, a little to the south of this place. Just as it seemed to be passing the body exploded, producing a sound that was distinctly heard, resembling that of a rocket explosion or a pistol-shot. After the explosion a body half as large as a full moon moved away to the westward, making a hissing, or frying sound. I have seen no one who saw the meteor before the explosion. The whole country was brilliantly lighted for a moment as if by a continued electric discharge, but at the time of the explosion the light was red and blue, or perhaps violet. The sound of the explosion was heard by parties five miles west and seven miles east of here, who could not have been less than ten miles apart on an air-line, and they report the sound together with the other phenomena to have been about the same as they were here. I have no reliable reports from any greater distance than that. But this indicates that the body must have been of considerable size, and at a considerable distance from the earth.

C. F. MAXWELL.

Dublin, Tex., Dec. 1.

### Ink-Stains.

To remove bad ink-stains from white linen (shirts, table-linen, etc.) place the stained part in Sabarraque's Solution, leaving the article in the solution until the linen is white. This must be used only for white goods. After a short time in the solution the ink-stain will gradually take on a copper color, gradually fading to a greenish hue, and finally nearly white. Washing in cold rain-water will finish. I believe this to be new.

A. M. WHITON, M.D.

Brockport, N.Y., Dec. 8.

## BOOK-REVIEWS.

*Eleventh Annual Report of the U. S. Geological Survey*, 1889–1890. Part II. *Irrigation.* Washington, 1891. xiv., 395 p. Pl. 30. Fig. 4.

*Irrigation and Water-Storage in the Arid Regions.* By GEN. A. W. GREELY. Washington, 1891. 356 p. Pl. 37.

*Final Report of the Artesian and Underflow Investigation and of the Irrigation Inquiry, Made under the Direction of the U. S. Department of Agriculture.* Washington, 1892. Parts 1, 2, 3, 4. Many Plates and Maps. 52d Congress, First Session. Sen. Ex. Doc., No. 41.

*Census Bulletins on Irrigation. Arizona, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Artesian Wells for Irrigation.* By F. H. NEWELL. Washington, 1891–1892.

*Extra Census Bulletin*, No. 23. *Agriculture. — Irrigation.* By F. H. NEWELL. Washington, Sept. 9, 1892.

THE subject of irrigation has of late years assumed an importance that it has long merited but has not received. If that man be a benefactor of the human race who makes two blades of grass grow where one grew before, how much more a benefactor was he who first drew from creek or river the waters the heavens refused to bestow, and who thus became tenfold, yes, a thousandfold, a human benefactor! Unfortunately, his name, his birth, his lineage, are all unknown, for the process of irrigation under one form or another has been practised since the earliest time of which there is any historic record. Perhaps the idea originated in those countries where rivers overflow their banks periodically, and where a certain definite time in the year may be considered to bring the flood. Be that as it may, in Egypt, in India, in China, irrigation has been a practice for many thousand years, and in these countries is now more extensively in vogue than ever before. It is not only in civilized and semi-civilized communities that irrigation is found, but in savage ones also, for recent travellers have noted the presence of irrigating ditches among certain African tribes, which, while not savage in the worse sense of the word, have still not yet reached the platform upon which semi-civilized races are assumed to stand.

In these older, eastern countries, irrigation is thus of very great antiquity. In the newer ones of the western and southern hemispheres, while of far less age, it cannot be said to be of any less importance. The Australian colonies have done a wonderful amount of irrigation engineering, this being necessary by reason of the peculiar climatic conditions and their vast tracts of otherwise unproductive territory. The work, too, being under government auspices, is of a more gigantic character than in any of the newer countries using irrigation. Of these our own country is not the least. In our western territory, while there are vast areas that can never be brought under the dominion of the plow and harrow, there are almost equally vast ones that will be gardens