

Correspondence.

Making Water Heat Itself.

To the Editor of the Scientific American:

In the articles appearing in your columns, Nov. 7 and Dec. 12, in regard to making water heat itself by means of placing friction wheels in streams, Mr. Server and also Mr. Baker seem to overlook the prime fact that the water gives out the same amount of heat in falling through its channel that it would in falling through friction wheels—the heat given out being due to the fall of the water, not to the arrangement of appurtenances.

JAMES M. DOUGHERTY.
Dundaff, Pa., Dec. 12, 1885.

The Preservation of Stone.

To the Editor of the Scientific American:

In reply to your invitation, I would submit the results of some experiments which I have recently made. I used a heated mixture of two parts of paraffine and one part of boiled linseed oil, applying several coats successively. After the stone was thoroughly dry, I applied a mixture of two parts boiled linseed oil and one part japan, adding enough zinc to permit an even flow of the material over the surface. When this second coat was dry, the treatment was completed by a generous application of japan. I found that the oil penetrated the stone to a considerable distance. Summer would of course be the best time for treating so large a mass as the obelisk.

J. A. HACKER.
Houston, Texas, Nov. 15, 1885.

"A Gateway to Knowledge."

To the Editor of the Scientific American:

In current issue I notice the letter with above title, "from an old subscriber," and I take this opportunity to indorse its truths. As I now sit in my office, with my huge pile of the bound volumes of the SCIENTIFIC AMERICAN and SUPPLEMENT—the first dating June 2, 1849 (with some interruptions), down to the present time—I reflect that *very much* of what I know of science, of the manifold appliances of mechanics, I have gleaned from those pages. How oft, in all those past years, when in want of light on some difficult problem in the construction of machinery, I have consulted those pages, and found the solution, or have got hints that led me out! Yes, I owe very much to my great encyclopedia of useful and practical knowledge, the SCIENTIFIC AMERICAN.

G. M. MARSHALL.
Kilbourn City, Wis., Dec. 6, 1885.

Poisonous Fish at Rotuma.

To the Editor of the Scientific American:

Rotuma, or Rotuam—for the natives have the habit of transposing the two last letters of many words—is situated about 280 miles north and west of Fiji, and, although geographically beyond the limits of the colony, it is a portion of, and belonging to it.

One of the principal articles of food has always been fish, which are abundant, and of many kinds. Since, however, the hurricane of 1884, this article of diet has materially failed the people; the fish are as plentiful, but the greater number are now poisonous. Many deaths, and much painful and long sickness, have resulted from eating fish that, until the blow, had been wholesome. The fact was first noticed on the northwest side of the island, immediately after the hurricane, the fish along the other parts of the coast, and latest on the southwest end, continuing sound; but the cause, whatever it was, gradually spread, moving east-about, until on the whole coast of Rotuma the greater portion of the hitherto edible fish have become unfit for food, and dangerous to life and health.

There is a sea reef of considerable dimensions about three miles north of Rotuma; and, in the hopes that the fish here were not tainted, a fishing expedition visited the spot a short time ago, and returned with quite a number of fine fish. All who ate of the fish suffered severely, many being made seriously ill for days. For the cause of this strange freak in Rotuma fish nature, no one can account, and the natives are bewildered. Some of the few fish that yet remain safe to eat are rock seeders, some ground fish, and some eaters of their kind, but the numbers are few, and the fish small, and inferior in quality.

I returned from Rotuma a few weeks ago, and am personally cognizant of the foregoing facts. Perhaps some of your correspondents may be able to suggest a probable cause for this singular and, to the natives, serious abnormality in the usual traits of the fish at Rotuma.

ROBERT S. SWANSTON.
Fiji, October 15, 1885.

THE production of lead in Germany has doubled since 1858, in spite of a simultaneous increase in the production of Spain and in the growth of the lead yield of North America from almost nothing to 140,000 tons annually.

Astronomical Notes.

THE NOVEMBER METEORS.

There is a possibility that we may not have to wait until 1899 for a brilliant show of Leonids, or meteors of the 14th of November. Professor Kirkwood, of Bloomington, Ind., has made a discovery which, if substantiated by observation, will prove to be of great importance. It is generally accepted that the meteors of the 14th of November are caused by a swarm of meteoric particles moving in the orbit of Tempel's comet of 1866. Professor Kirkwood asserts that there are three meteor swarms traveling in the same orbit. The principal group of the three is the well known one that produced the showers of 1833 and 1866, another shower being expected in 1899. The period of this group is 33.25 years. The second group was identified in 1875 from the dates of meteoric showers given by Humboldt and Quetelet, the period being about 33.31 years. The next shower from this group will be due about the 14th of November, 1887, but the display may commence at that time in 1886.

The third group has been less thoroughly observed than either of the others. Its period is about 33.19 years, and another shower may be expected in 1912.

A comet was observed in China in 1366 that is thought to be identical with that of 1866. For 500 years the difference between the two dates is very nearly equal to 15 times 33.25 years. Professor Kirkwood suggests that the diminution of the comet of that year may have been caused by the separation from it of the first and largest of these groups.

The truth of this theory will soon be tested. If it be tenable, either next year or the year after a great meteor shower will take place, the Leonids will muster in full force, and the heavens will be aflame with falling stars. We have faith in the prophecy, but not without misgiving. Disintegrating comets and meteor swarms are curious members of the solar system. It will be long before we shall fully understand their origin, the place they hold in the economy of the universe, and their final destiny.

TOTAL ECLIPSE OF THE SUN ON THE 8TH OF SEPTEMBER.

Interesting observations have been reported from various observers in New Zealand who witnessed the recent total solar eclipse. It will be remembered that the only land over which the belt of totality passed was the portions of New Zealand bordering on Cook's Strait. Nothing new seems to have been learned during the progress of the most grand and imposing spectacle on which mortal eyes ever gaze. The observations were, however, successful and of exceeding interest. An observer in Wellington thus describes in *Nature* the wondrous vision. About fifteen or twenty seconds before totality, the whole disk of the moon suddenly became visible, the further limb of the moon being seen projected upon the white background of the corona. During totality, great masses of cloud, on the horizon, appeared lit up with sunset tints. The corona extended from the moon's limb more than two lunar diameters, the coronal light quivering in a way that reminded one of the aurora.

An observer at Nelson gives this account. As the period of totality passed, a bright point of light as from a diamond of wonderful brilliance shot forth from the upper surface of the moon. At first it seemed to be only a flame, but it speedily extended to the moon's shadow, passed downward, and totality was over.

The enthusiastic members of a party that had encamped at the foot of Otahua, climbed to the top of the mountain, and arranged their instruments amid driving snow and hail. Just before totality the sky cleared, they were able to take several photographs successfully, and the grand phenomena attending a total solar eclipse were fairly visible.

The eclipse was observed at Blenheim on the outer edge of the belt. The totality here lasted but a few seconds; but the corona and rosy protuberances were plainly visible in all their grandeur and beauty. Several stars were seen, and the general appearance of the sky, the shadows on the hillside and on the water, was that of early dawn.

An observer at Tahoraite, 40 miles north of the center line, devoted his entire attention to the corona, and succeeded in obtaining several satisfactory sketches of its contour. He describes a dark rift in the corona reaching to the sun's disk.

Other observers noted that an immense red flame shot out suddenly close to this rift just as totality closed. Southerly squalls, hail, and snow prevented observation at several stations. All observers, however, agree in noting the sudden fall of the temperature, the numerous rosy protuberances, the beautiful sunset hues, the quivering of the corona, and the magnificence of the spectacle, which words are powerless to describe.

THE CORONA VISIBLE TO THE NAKED EYE ON HIGH MOUNTAINS.

Professor Tacchini, a great authority among scientists, gives a remarkable piece of information in a letter to *L'Astronomie*. He records that M. Favel asserts that on high mountains, when the sky is serene, the

solar corona is so apparent that it strikes all observers. The mountaineers and dwellers among the Alps agree in affirming that the phenomenon is something entirely new. Tacchini also gives an experience of his own on the subject. He made the ascent of Mt. Etna in July last. When near the volcano, at a height of over 10,000 feet, under a clear sky of a dark blue tint, he saw the sun surrounded by a white aureola, concentric with a magnificent corona of a coppery red. The corona was transformed near the horizon into an arc less defined and of much greater extent.

"The Dollar Medical Shop."

A Hartford correspondent, who signs himself "A Druggist," has entered a protest against the reference to his class in an article under the above caption, which appeared in a recent issue. He begs to remind us that the large responsibility of an apothecary, which forces him to satisfy himself that the prescribed doses are correct, that the ingredients are mixed so as to give the full effect of all, and that the mixture does not form an explosive compound, together with the time required in preparing the prescription, make it absolutely necessary that his charge shall be largely in excess of the simple cost of the unmixed drugs. These considerations we have not overlooked, and they are of sufficient weight to make a profit of two or even, in some cases, three hundred per cent quite justifiable. If the matter stopped here, reasonable people would not be disposed to complain; but when the percentage is carried beyond this, and occasionally is doubled or even trebled, there is just cause for a protest. There is another element which deserves attention in connection with this excessive charge. In almost all lines of business, competition lowers prices; but in the prescription department of most drug stores, it seems to have had the opposite effect. Fancy goods and the thousand and one ready made articles which make up the stock of a retail druggist are open to comparison, and their price is regulated accordingly; but in a prescription the ingredients are usually unknown to the purchaser, and he has therefore no standard of comparison by which to judge of their value. As the same prescription is seldom filled at two different shops, there is really no competition, for the purchaser cannot assert that one man is more excessive in his charges than another. Add to this the fact that there are probably twice as many drug stores in the country as can possibly make a comfortable living, and it cannot be denied that there is a strong temptation for the charge to be made out of all just proportion, when there is so little chance of the extortion being discovered. All druggists, to be sure, do not yield to this temptation, and our Hartford correspondent is no doubt one of the exceptions, but a sufficient number of them do, to make it very well worth the attention of the benevolent to see that the poor are supplied with medicines at a cost more nearly approximating to their real market value.

The Van Depoele Electric Railway.

The city of South Bend, Ind., has introduced an electric street railway. The system in use, the Van Depoele railway, has been in successful operation at Toronto, Canada, for the past two years, and it is expected to be introduced shortly into Minneapolis and Detroit.

The railway at South Bend is operated by an electric current transmitted by overhead wires. The current is generated by three Van Depoele dynamos, which form the stationary motive power plant, and is conducted to the motor of the street car by means of a wire extending from the overhead cable. From the motor, the current passes through one of the wheels, and by means of the track the circuit is completed. In order to make the track a perfect conductor, strips of brass are laid under the joints of the rails. As but one track is used, the cars must pass each other on switches, and an ingenious device provides for this necessity. It consists of a brass and copper frog or switch, attached to the copper wire. This hangs directly over the frog in the track. It is so arranged that the motor connecting wire passes through it on one side when going in one direction, and through on the other side when returning. The action is entirely automatic. A speed regulator is attached to each car, and operated by the driver. It consists of a small cylinder through which the current passes. A crank handle on the top of this cylinder regulates the speed, and its position in numbered notches shows at a glance the rate at which the car is traveling. The highest speed allowed by the regulator is eight miles an hour. The railway has been constructed under the personal supervision of the inventor.

A New Comet.

A cable message from Dr. Krueger, of Kiel, received recently at the Harvard College Observatory, announces the discovery of a faint comet at Paris. Its position at the time was: right ascension, 39° 8' 5"; declination north, 21° 2' 25"; daily motion in right ascension, 2' 23"; in declination south, 3'. It has since been observed at Harvard by Mr. Wendell, and its position determined on Dec. 2 to be: right ascension, 39° 8' 30"; declination north, 21° 0' 30".