

## POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE:

[Reported expressly for the Scientific American.]

On Wednesday evening, the 9th inst., the usual weekly meeting of the Polytechnic Association was held at its room in the Cooper Institute, this city; President Mason in the chair.

## MISCELLANEOUS BUSINESS.

*Improved Kettle.*—F. C. Treadwell, of this city, exhibited a kettle for cooking farina, rice, fruits, &c., which are liable to be burned in an ordinary kettle. The vessel in which the food is cooked fits into another containing water.

Major Serrell—How does this contrivance differ from a glue-pot?

Mr. Treadwell—Very little. The outer vessel here has a spout attached near the top, by which water may be poured in without disturbing the inner vessel. The spout also serves to carry off the steam. These kettles are now quite common, and I introduce the subject here only to make a claim for its first invention. They were first made for cooking farina; and my success seemed a mystery to those who were ignorant of the simple apparatus I used. The gallon kettles are sold for \$1.50; the two-gallon, for \$2. Three quarts of water and one-half pound of farina make three-and-a-half quarts of farina jelly.

The President—What is the philosophy of the burning in the ordinary method of cooking food like farina?

Professor Hendricks—The solid matter becomes separated from the fluid at the bottom, adheres to the kettle, and, being a poor conductor, the heat is accumulated, and the substance burns or is charred.

*Working Steam Expansively.*—Mr. Rowell read some statistics of experiments recently made at the Metropolitan Mills, in order to test the working of steam expansively. The results seemed unfavorable to the ordinary theory and practice. But some of the members thought that some of the elements were omitted which should be taken into account to render the test satisfactory.

*Filters.*—Mr. Haskell presented a report favorable to Baxter Brothers' filter.

Dr. Stevens—Filters do not purify water from what is often the most unhealthy contamination, namely, organic matters in solution. Nature's method is to filter and purify by means of earth or by the distilling process of evaporation. Water from a barn-yard may be made sweet by passing a few feet, only, through the proper kind of soil.

The President—Are not the mineral matters in solution also unhealthy?

Dr. Stevens—Some of them. But water containing lime is good medicine for certain diseases of the bladder and for scrofulous constitutions.

*Gas-burners.*—The Committee on Gas-burners (Messrs. Seeley and Hendricks) presented a lengthy report unfavorable to "Johnson's patent gas regulator and burner combined." The committee are of opinion that all the alleged advantages of the Johnson burner, and of the various stuffed burners, may be more easily attained by simply enlarging the apertures of the ordinary burner, and checking the flow at the stop-cock; and that the economy thus gained might be compensated by the necessity of using spreaders and chimneys to prevent steadiness and smoking. Mr. Garvey, a member of the committee, disagreed with the report, believed that it was unscientific, and promised to prepare a minority report. The club decided to take up the reports for discussion on the 24th inst.

The hour for the discussion having arrived, the president announced the regular subject—"Expansion."

## DISCUSSION.

Mr. Reed said that, as some doubt had been expressed on the statement made at a late meeting, that rails on the Erie Railroad are being laid so that their ends are in contact, he had taken some pains to verify it. He was satisfied that the statement was correct, and he was assured that, so far, no signs of bending or "buckling" had been observed.

Mr. Dibben—If rails be laid at 10° below zero, and the temperature be raised to 100°, I cannot doubt that the expansion would be noticeable. If the Erie road plan is used, the rails should be laid near the mean of the ordinary temperature.

Mr. Reed—In 18 feet of steam pipe, I have been unable to observe any expansion in its ordinary use, except the tightening of the stop valve.

Mr. Rowell—In the old roads, a distance of one-eighth of an inch between the rails was left as allowance for expansion, and this distance was often closed up. The rails were about three-eighths of an inch thick.

Dr. Stevens—The Erie road has a serpentine route, and any expansion would take effect laterally, and only to alter the curves in an appreciable degree. On the straight roads of the West the expansion is noticed, and is a great annoyance. The ties are sometimes lifted-up, and even the whole track is loosened from the earth, rising like a wave in front of a moving train. In one case, when the track was taken up on account of damage so done, the rails were re-laid with a considerable interval between, which was filled by driving in chips of wood. This device was used in a track 25 or 30 miles in length.

Mr. Cooper suggested that the Cooper Institute was well provided with instruments to determine and measure expansion, and that, should the club desire, they should be brought in at the next meeting. The offer was received with applause.

The President—The space between rails has always been a fact of annoyance to those connected with railroads. Science seems to teach that the spaces are necessary; if they are not, it is a novelty of the greatest interest. Many railroad men will look upon Mr. Reed's statement as incredible.

Major Serrell—I see by the reports that it was stated at the last meeting that iron is weakened by vibrations and concussions; and that, from this, some day, Niagara bridge might fall; a disaster in which I should have a personal interest. I have little fear, however, of such an event; for we have examples of similar structures which have stood sufficiently long for the test. In China, there is a suspension bridge which was erected in the time of Julius Cæsar, and which, at last accounts, was still in good condition. In the Basse Alps is an iron chain, put up by the knights of Rome (600 years ago), and it is still in a good state of preservation. Mr. Brunel told me that he was of opinion that good wrought iron would not be weakened by vibrations, the ordinary of which was less than one-third of what would produce a permanent bend. The amount of expansion of iron has been accurately determined. I have a card which was marked by a pencil attached to the moving end of the Britannia tubular bridge. The card was kept under the pencil for a day, and the mark is about two inches in length.

Mr. Fisher—Iron is somewhat compressible and elastic, so that if rails be well fastened down, it is possible sufficient resistance might be offered to prevent the expansion.

Mr. Seeley—Some of the expansion of rails alluded to here may be due to their being rolled out by the weight of the trains. When the lengthening is permanent, this is a sufficient explanation.

The same subject was ordered for the next meeting, after which the association adjourned.

**PATENTS.**—Many of our subscribers are interested in procuring patents for improvements connected with the manufacture of leather and of boots and shoes; and, from time to time, we receive inquiries relative to these matters. Where any professional assistance is required, we invariably refer the parties to Messrs. MUNN & CO., of New York and Washington, the publishers of the SCIENTIFIC AMERICAN, who have now the most extensive and best organized patent agency in the world. One-third, or more, of the entire business of the United States Patent Office passes through their hands. Their facilities have been recently still further extended by the accession to their regular force of Judge MASON, well-known as the late Commissioner of Patents. The SCIENTIFIC AMERICAN has entered upon its fifteenth year. During the past year it has been enlarged and otherwise improved. Its typographical execution, as well as its editorial management, has always been excellent. The subscription price is \$2 per annum.

We copy the above very excellent notice from the *Shoe and Leather Reporter*, a valuable journal published in this city.

In the "pleistocene (geological) period" a huge elephant, clothed with wool and coarse hair, roamed through the northern portions of this continent and obtained his food from hardy trees, such as now grow in the 65th degree of north latitude. Abundant remains of this animal have been found in the temperate and high northern latitudes of Europe, Asia and America. The musk buffalo was its cotemporary in Europe, where it is now unknown, but it still lingers in the northernmost regions of America.

## A COLUMN OF VARIETIES.

The first locomotive west of the Missouri river commenced to run on the 26th of last month (April), on the St. Joseph and Marysville Railroad; this is intended to be a section of the Central Railroad to the Pacific.

A commercial institute in Louisville was chartered by the last Legislature of Kentucky; and it is now proposed to erect an observatory in connection with it. Measures have been taken to procure a proper site for a suitable building.

Native iron has been found in very few localities. In Canaan, Connecticut, there exists a seam of it, two inches in thickness, from which good horse-shoe nails have been forged. This seam is so small, however, that it will not pay expenses to work it.

Some experiments were recently made at Liverpool (England) by Mr. A. Lindsay, for sending electric messages through the river Mersey without wire or cable. Large metal plates were sunk at each side in the water, and connected with the batteries. A current was sent through the river so as to move the needle of a galvanometer, but it was more curious than useful in its operations. Improvements, however, may yet render this system practical for telegraphing.

The Sydney (Australia) *Herald* is printed on one of Hoe's six-cylinder lightning presses. Its whole cost, after it was put up, amounted to \$30,000. The Australians have no native aristocracy; they are growing up to republican self-government, which will be effected at some future day without a revolution. No less than twenty drinking fountains have also been put up in the streets of Sydney. Our South Sea cousins are going ahead.

Stevens' floating battery was again before Congress last week. This "institution" was intended to be a floating shell and ball-proof battery, moved by a propeller, for defending New York harbor. It was commenced several years ago (under a government appropriation) by the late R. L. Stevens. It has cost several hundred thousands dollars, and is still a marine skeleton, confined within an inclosure at Hoboken and is generally considered a government *fossil*.

The steamship *Great Eastern* is being rapidly prepared for her trial trip across the Atlantic, and it is expected she will be completed in the beginning of next month, so as to accompany the Prince of Wales in his visit to our continent, in July. Her proprietors having sent word to this city that she would come here if it were possible to get her into the harbor, the Board of pilots have returned an answer that they will navigate her right straight up to "Gotham," if she does not draw more than 26 feet of water. It is believed that the "Knickerbockers" will yet see the "Leviathan."

In one of Lord Brougham's recently-published mathematical and physical tracts, it is stated that one of the papers on light and color had been published in the Philosophical Transactions for 1796, with omissions of parts that were in the copy sent to the Royal Society. These omissions contained remarks on the effects of exposing a plate of ivory, moistened with nitrate of silver, to the rays of the sun passing through a narrow aperture into a dark room. The secretary—Sir C. Blagden—did not consider these pure science, and withheld their publication. Had they appeared they would have led to the discovery of photography fifty years before Daguerre and Talbot.

According to the experiments of Professor W. R. Grove, F.R.S. (inventor of the celebrated intensity battery), electricity cannot be transmitted through a perfect vacuum. Ordinary matter is required for its transmission; if space could exist void of matter, then there would be no electricity. Mr. Grove says "electricity is an affection or mode of motion of ordinary matter."

Dew has peculiar properties. It differs from fine rain and common moisture because it is never deposited on any surface except it is colder than the surrounding atmosphere. Most dew is deposited in clear nights when the greatest amount of radiation goes on. It never falls copiously in places screened from the clear sky; a thin piece of muslin, suspended over a delicate flower, will prevent the dew being deposited upon it.

A total eclipse of the sun will take place next July, visible in some parts of this continent, extending, in a belt, from Labrador to the Pacific, through the British possessions. Lieutenant Gillis, U.S.N., has been appointed to take observations in Labrador, and Captain Reynolds, U.S.A., in the interior.