Correspondence.

Storage of Wind and Wave Power.

To the Editor of the Scientific American:

I have read with interest several articles that have appeared from time to time in your valued paper relative to "storing power." In No. 10, vol. xlix., you say, "Let us hope for success and try again." This led me to put in my oar.

I understand the object of this discussion to be an interchange of views in order to bring out something tangible, something beneficial, and within reach of those desiring power, however great or small their requirements. All agree that power lost or allowed to go to waste, if properly and successfully stored, would turn every wheel between the oceans. To accomplish the object sought, some person or company of persons must provide for the storage of this power and sell to consumers for propelling machinery, ventilation, cooling, etc., as do gas companies sell gas for light.

The tide of the ocean, water falls like Niagara, Genesee, Catskill, and others, the wind, and the thousand gas wells in New York, Pennsylvania, Virginia, Ohio, and Michigan, may be set to work, their great power united and stored to be drawn from.

The one thing necessary to successfully carry into effect and accomplish this great object is a highway that shall be safe, durable, and simple in its construction, for the transmission of this stored power to its thousand consumers.

These several powers, mighty as they are, can be united and stored as one power, its successful application to machinery accomplished and carried into operation, by laying a large pipe 6 feet in diameter (like a water main) from New York to Chicago and elsewhere where required, the pipe to stand 250 pounds pressure per square inch, and be a receiver of compressed air with proper inlet and discharge pipes. This pipe to be a common reservoir, and at the same time be a transmitter of the power it shall receive from air pump stations along the line.

Erect tide wheels at the seaboard, wind wheels, water wheels, and gas engines at convenient and suitable places along the line, connect with the main by air pumps, set the machinery at work, and draw from the stored power at New York, Chicago, and intermediate points at pleasure. I have given an outline of my plan for storing power, the details of which are too lengthy for an article of this nature.

The advantages to be derived from such a combination of power stored are varied and extensive, the principal of which are readiness for use, safety from fire and consequent reduction in insurance, entire absence from boiler explosions, no smoke in manufacturing cities, location at pleasure of machinery with reference to convenience and dispatch for doing business, perfect ventilation with pure air in any public or private building, and all practically without expense for fuel, engineers, or labor of any kind. In construction the pipe is its own bridge for streams and rivers; grades and curves may be made without extra cost; wheels and pumps may be made to spin and pump away without aid of engineers.

Store waste power for use, and save coal to bake bread and warm feet.

Shall we admit that this cannot be done?

E. S. VAN LIEW.

West Bay City, Mich., September 22, 1883.

The Locomotive Whistle.

To the Editor of the Scientific American:

To the testimony already furnished as to the distance locomotive whistles may be heard, I would add that the roar of trains and their whistles has come to us from Jamesburg, over eleven miles distant, besides some factory whistles from points beyond, whose exact distance is unknown. A nitroglycerine explosion, near Rahway, was heard and felt here so that it was thought to have been in my laboratory.

On June 30 last, a farmer in a hay field near here attempted to shield himself from a passing shower, by holding a fork full of hay over his head. The fork was struck by lightning, and the man killed. Since then the fork has been strongly magnetic, and was recently used to pick up tacks. CHAS. F. RICHARDSON.

Freehold, N. J., Sept. 24, 1883.

"Dollar Weights and Measures."

To the Editor of the Scientific American:

It is charming to read the discovery of a new system of weights and measures planned out by your correspondent, Hubbell, for the benefit of mankind. It shows the decimal system in its glory, and but for its deficiency would be *non plus ultra.*

The dollar is and no doubt will be the governing agency in business transactions, but as a poise for weighing coal I think it would be rather inconvenient.

Eagles, double eagles, states, and territories! Bless your soul! who would ever get to know what they look like? And would it not be awkward to ask for trimmings or bolts 6 dollars long, when a dollar has no length at all?

Let us rather wait a little for a universal system of money, weights, and measures, that must and will come as an absolute necessity for trading with all nations, instead of trying to improve on a system past recovery.

Philadelphia, Pa., September 17, 1883. F.

Vitality of the Dried Willow Germ.

To the Editor of the Scientific American:

During the summer of 1853 Silvester Piper, now a resident of 3526 Jones Street, this city, called my attention to a willow basket in a ditch which had sprouts several inches in length all around it. A curiosity so remarkable—possibly having no parallel—led me to take immediate steps for its preservation.

I dug the basket up with the greatest care, and found it to be a worn out castaway, which had done service as a basket until it had become so badly worn as to render it worthless, when it found its way into a ditch at the base of the bank of the Illinois and Michigan Canal, about 300 feet from the Bridgeport lock (now within the city), from whence I transplanted it with great care, placing it in a wet place in my father's garden; but notwithstanding its former vitality and careful removal, the shock was too great for the tender shoots, and they all died.

The basket was made wholly or in part of unpeeled willow, whose dried and withered germs needed only the opportunity to return to life. I have often resolved to have the story of the "willow basket" written and placed upon record, while there were still living other witnesses than myself to verify it.

O. GUTHRIE.

Having seen the basket while growing, we can vouch for the truth of the above.

SILVESTER PIPER.
OTIS PIPER.

Chicago, September, 1883.

Boiler Explosion at Topeka.

To the Editor of the Scientific American:

Last night, about half-past eleven o'clock, both the boilers in the Shawnee flouring mills, of this city, exploded with terrific force. Pieces of stone, brick, sheet iron, wood, etc., were scattered in all directions for the distance of a block or more. The engineer, Leroy Mills, was scalded so that he died this morning at ten o'clock, after suffering intense agony.

There were two boilers, used to run an engine of 100 horse power. The engine room was built in an alcove of the main structure, and was a building 30 x 50 feet, one story high, built of brick and stone. The building and contents were blown to atoms, except the engine, which was not materially damaged. The main parts of both boilers were blown through two stone walls, each 18 inches thick, into the flour room of the mill. Brick, stone, and mortar were thrown in among the millstones and rollers, but the machinery is little injured. The loss is estimated at $5,000. A boiler head with about six feet of the boiler attached, and weighing five or six hundred pounds, was blown west of the mills about two blocks. A piece of casting, weighing about three hundred pounds was found in the center of Kansas Avenue, one hundred yards off, and a piece was found a block from the mills in the opposite direction.

Several theories are advanced as to the cause of the explosion. According to the night miller, who was in the engine room not more than two minutes before the disaster occurred, the water in the gauge was at its usual height. He says there was about seventy pounds of steam on at the time. Mr. Griswold, one of the proprietors of the mill, said this morning: "We shut down yesterday and cleaned out the boilers, and it is my firm belief that the explosion must have been caused by a want of water in the boilers. The probabilities are that the pump pipes got stopped up some way or other, so they could not discharge their supply of water into the boilers. Before starting the engines, at five o'clock, the boilers were filled, as shown by the water gauge, and I believe a speck of dirt got into the instrument then, thus holding the supply of water and deceiving the poor engineer. The boilers were put in about one year ago, and therefore could not have been worn out."

Your correspondent measured a spot in a large piece of one of the boilers which was but one-twenty-fourth of an inch in thickness, and it did not have any appearance of having been torn so thin. Another place was two-thirtieths and another three-eighths, the latter figure being the thickest part. The measurements were made with a pair of calipers and a steel rule, graduated to one-hundredths of an inch. It was impossible for me to tell just what part of the boiler this piece came from.

Messrs. W. Tweedale and John Richards, both practical engineers, viewed the ruins this morning and each advanced a theory. One is that the lower parts of the boilers were worn and burned so that they leaked the water out nearly as fast as it was pumped in, and the other is that there had not been water in the boilers for so long a time that a pressure of seventy or eighty pounds of steam was greater than the iron so burned or worn could stand, and it therefore gave way.

A. E. D.

Topeka, Kansas, September 4, 1883.

American Laboratories for Instruction.

To the Editor of the Scientific American:

An article in your paper of June 16 has recently been brought to my notice. It is entitled "The French Physical Laboratories;" and while describing well the work done at the Sorbonne by Prof. Desain, the writer makes statements which come short of giving due credit to what has been accomplished in this country, not only in the line of original research, but also in the establishment of schools for instruction in the special departments of chemistry and of physics. He says: "But the day is passed when chemical students are obliged to cross the ocean. Nine years ago a chemical laboratory was opened in this city, where analysis was taught and practiced, and six or seven years ago a laboratory for research, equal to any in Europe, was opened in Baltimore."

Now it is true that he does not directly assert that these two institutions were the first of their class on this side of the Atlantic, and stood alone, but that is certainly the only fair inference to be made. Again, he says: "About ten years ago Professor Pickering established the first working physical laboratory for purposes of instruction in the Institute of Technology in Boston." This is positively wrong; he ought not to have written without being sure of his statements.

Let us look back a little and see what has really been done in the direction indicated. Forty years ago, that is, in 1843, Prof. Silliman (Benjamin Silliman, Jr., as he was then) commenced to give instruction, on the plan of Liebig, to private pupils in analytical chemistry and in original research. Among the first of these pupils were John P. Norton and T. Sterry Hunt. The instruction was given in an apartment of the old laboratory of Yale College, but it was entirely a private enterprise, and continued so for four years. In 1847 the school had grown so far that the College organized a fourth department devoted to philosophy and the arts, and the first appointments to this "Yale Scientific School" as professors were of Mr. Silliman and Mr. Norton. The Sheffield Scientific School is the successor in this line, taking its name in consequence of the munificent liberality of Mr. Joseph Sheffield. Three of the professors at the present time in the Sheffield Scientific School—Brewer, Brush, and Johnson—are among the first students of the Yale Scientific School. The impulse to advance in knowledge which has been given by those who have had their sole training here within the last forty years is most certainly not to be ignored.

An endowment of $50,000 in 1848 by Mr. Abbot Lawrence established the Lawrence Scientific School at Harvard, and Professor Horsford was placed at its head. The institution has experienced a series of changes, but in the midst of them all has furnished a most valuable amount of instruction. When Prof. Horsford resigned and Prof. Gibbes succeeded him, the Rumford Fund was diverted to the support of this department, but that has since been restored to the intent of the founder, and goes now to sustain the Engineering School under Prof. Eustice, the chemistry being assigned to Prof. Cooke.

In 1864 the School of Mines was inaugurated in Columbia College, under the charge of Dr. Chandler and Prof. Eggleston. And again, in 1864, not "about ten years ago," the Technological Institute of Boston was originated and endowed. This was due in its inception and its completion to Prof. W. B. Rogers, for a long time one of its governing board, and later still its president. He lived to see his great work yielding results which perhaps fully realized his highest anticipations, and crowned with honors he has, as we all so well remember, but recently passed away. One part of the plan which he elaborated involved thorough instruction in physical research, and the construction and fitting up of a laboratory thoroughly provided with the means of such instruction. This was done under the supervision of Prof. Pickering, who was placed at the head of that department. It is scarcely necessary to speak of what that institute and that department has done. Like Lexington and Bunker Hill, there they are; "they speak for themselves."

Perhaps there is no need of going further. But from these few statements it seems as though we might trace back instruction in chemistry and in physics somewhat more than "nine years" or "ten years" in America.

W. O. A.

Conversion of Light into Electricity.

The production of light from electricity is so well known that it may have seemed singular that light would not generate electricity. The latter has actually been accomplished by Sauer, who has constructed a battery that acts only in sunlight. In this case it is the chemical constituent of the light that furnishes the power. Heat rays acting upon a thermo pile also produce a current.

Sauer's battery consists of a glass vessel containing a solution of 15 parts of table salt and 7 parts of sulphate of copper in 106 parts of water. Within is a porous cell containing mercury. One electrode is made of platinum and is put in the mercury; the other is of sulphide of silver and is placed in the salt solution. Both are connected with a galvanometer, and the whole is inclosed in a box, when not in use. When the battery is placed in the sunlight, the galvanometer needle is deflected to a certain point and the sulphide of silver is found to be the negative pole. Any change in the intensity of the light, such as a cloud over the sun, is indicated by the needle. The action of the battery depends on the effect of the chloride of copper upon the mercury. Subchloride is formed and reduces the sulphide of silver, but this can only take place with the aid of sunlight.

Hitherto the only manner in which light seemed to affect electrical action was by increasing the resistance of a selenium cell, and all photo-electrical experiments were based on this phenomenon.

Sauer's battery will be found described in the *Electrotechnische Zeitschrift.*