is a convenient substitute for that of the foot against the ground. I recently had a beautiful illustration while riding slowly on the horse-cars in New York. A vehicle passed rapidly between me and a picket fence, every stroke of its wheels against each stone of the pavement being returned as a whistle from the opposite fence. The acoustic effect was much like that of the trilling of a canary bird.

I cheerfully accord to Prof. Robinson the credit of giving mathematical expression to this truth. His observation is none the less original even if others have preceded him, and I am by no means sure that any one has preceded him in giving it publication.

W. LE CONTE STEVENS.
40 W. 40th St., NEW YORK.

Dec. 17th, 1881.

NOTES FROM OUR FOREIGN EXCHANGES.

Phosphorescent Fungi—At the present day, several inferior species of fungi are known, which have the power of throwing out a phosphorescent light. M. Crié, Professor of the Faculty of Sciences at Caen, has noticed new species which spring up on old stumps or between the bark and the wood of the elder-tree.

Rectification of Inferior Alcohol.—Electricity is now employed in the rectification of inferior alcohol. The electricity generated by a voltaic battery and a dynamo-electric machine is passed through the alcohol so as to disengage the superfluous hydrogen. By this means, beet-root alcohol, which is usually very poor, can be made to yield eighty per cent. of spirits, equal to that obtained from the best malt.

A Japanese Antelope.—Several interesting acquisitions have recently been made by the Zoological Garden of London. Among other rare animals, it has obtained a Japanese antelope which has never before been in any collection in Europe. The antelope of Japan (*Capricornus Crispus*) is found only in the highest mountains of the Niphon and Shikoku islands. Very little is known of its habits and it has been but incompletely described by Siebold in his Fauna of Japan.

Phosphorescent Ice—Mr. J. Allen has written to "Nature" an interesting letter, in which he describes a curious phenomenon of phosphorescence of floating ice, observed in the Polar regions. Every time that the bow of the ship, where the observer placed himself, shattered the ice during the night, the ice suddenly shone with a very perceptible light. It is a light similar to that which is produced on the breaking of sugar, the cleavage of sheets of mica, or the striking together of pieces of flint in the dark.

Electric Fusion of Metals—M. Siemens, in the presence of the members of the Congress of Electricians, performed the following curious experiment: in a crucible conveniently arranged, furnished with a perforated cover, fragments of steel were placed; the two currents of an electro-motor apparatus entered the lower and the upper part of the crucible. In 14 minutes the metallic mass became hot, reddened and melted. The mass showed no inflation. The expense of the combustile consumed by the electric apparatus is much less than that which fusion by direct application of heat would necessitate.

Electricity produced by Light.—While traveling in Mexico, M. Lœur, mining engineer, was struck by the fact that the *amalgamation* of silver ore, by what is called the *American* method, only operates well under the influence of light. According to him, the action does not take place in the darkness. He sought the cause of this unexpected effect and his experiments seemed to him, to show that light, by acting upon the mixture of sulphide of silver, sulphate of copper, salt and mercury, develops electricity without which the amalgamation cannot take place.

M. Boussingault, however, expressed an objection to this conclusion, which appears decisive; that in Mexico, the operation is not confined to small quantities, but whole mountains of ore are acted upon. Now light is only able to act upon the periphery of the latter, and the largest part of their mass remains in permanent darkness.

The Telephone in a Storm.—A very curious experiment was made and announced by M. René Thury, of Geneva. He stretched a metal wire from one roof to another. One extremity of the wire was in connection with a telephone, the opposite extremity with the earth. During a storm, every time there was a lightning stroke, even at a distance of 20, 30, and even 40 kilometres, the telephone gave a very characteristic sound. This noise, according to M. Fleury, was due to the peculiar electric currents, called currents of induction, produced under the influence of the atmospheric electric discharge. It was a sort of return impact.

The Sulphate of Alumina of Commerce.—For a long time there has been a tendency to substitute sulphate of alumina for potash or ammonia alum, since it is richer in alumina. But the manufacture of pure sulphate of alumina, that is to say, free from iron, is not easy, at least in an economical point of view.

During the last twenty years, pure hydrated alumina has been prepared at a low cost, and by saturating this alumina by sulphuric acid, a warm liquid is obtained which congeals into a dry and easily transportable mass of sulphate of alumina containing about 15 per cent. of alumina.

The products obtained in this manner are relatively expensive, and it would be a great advantage to purify the ferruginous sulphate of alumina furnished by the action of sulphuric acid upon common clay, if this purification could be accomplished by an easy and less costly method.

Extraction of Magnesia from Sea Water.—*The Moniteur des produits chimiques* contains the following method of abstracting magnesia from sea water: "magnesia can be precipitated from sea water by means of calcium, just as from other more concentrated solutions. After precipitation and rest for a day, a cubic metre of sea water gives a precipitate of gelatinous magnesia, about 80 litres in volume. The treatment on a large scale of water whose magnesia is to be deposited in large basins, can easily be accomplished, speaking in an industrial point of view; the calcium will be the greatest expense.

If the magnesian sediment thus obtained is treated with phosphoric acid, a precipitate of tribassic phosphate is obtained, which, filtered, becomes an excellent chemical agent for the precipitation of ammonia from excrements in the form of ammoniac-magnesian sulphate, which is a powerful manure.

Spontaneous Combustion of Carbon.—Spontaneous combustion in colliers is a very important question, for, in 1874, 70 cases of this kind occurred. The recent investigations of M. Haedicke have thrown light upon this subject. These experiments were conclusive in proving that this combustion is due to the influence of iron pyrites. This substance becomes oxidized when submitted to moisture and is changed into ferrous sulphate. During this decomposition, the carbon bursts and offers a larger surface to the action of the air. The ferrous salt is then transformed into a ferric salt which yields up its oxygen to the carbon. In order to prevent spontaneous ignition, all currents of air should be excluded, unless they should be allowed to enter from the beginning in great quantities, so that the air acts as a cooling agent. As moisture prevents ignition and the accumulation of oxygen, the introduction of a jet of steam, where the temperature of the carbon has been raised to a high degree, will also act as a preventive.

Sea-sickness.—A correspondent of the "Paris Medical" has sent a communication to the editor, which will prove interesting to many persons who suffer sea-sickness in their travels.

"In a recent voyage from Algeria to France," he writes, "the sea being very rough, and almost all the passengers being sick, the officers of the ship could offer but insufficient means of relief. Among the passengers there was one, about thirty years old, who suffered cruelly. He vomited continually for thirty hours, and his sufferings became so severe that the surgeon had to be called. After hearing him prescribe lemon juice, I asked him if he had not morphine or chloral. To my astonishment he replied that he had none. I then offered him one centigram of morphine and my syringe. This was accepted. A solution was made in 20 drops of water, was injected into the epigastrium, and, a half hour afterwards the sickness was allayed. He ceased

vomiting and remained unmolested during the rest of the journey. This fact appeared remarkable to me. The benefit had been immediate." If this observation can be confirmed by other similar cases, it would be very fortunate, for then the surgeons of the maritime and transatlantic companies would be able to relieve passengers who suffer seasickness.

THE SEPARATION OF WOOL AND SILK IN WOVEN GOODS.—A. Rémont.—The following method is sufficiently exact for commercial purposes: the sample is kept for a quarter of an hour in boiling water containing 5 per cent. of hydrochloric acid, and is then washed and dried. The threads of the warp are then separated, if possible, from those of the weft, and examined separately as follows: a thread is burnt. There is given off a smell like burning horn, and a thread heated with a fragment of caustic soda evolves ammonia. In this case some threads are plunged in basic zinc chloride at a boil. If they dissolve completely the threads are *silk*. If on adding hydrochloric acid there is a plentiful flocculent precipitation, the threads are silk mixed with wool or with vegetal fibres. If nothing dissolves in zinc chloride, the threads are plunged in a boiling solution of soda, not too concentrated. If they dissolve completely, *wool*. If partially, *wool* and *cotton*. If no odor of burnt horn is given off, the threads consist entirely of vegetal fibres. These results may be confirmed by means of the microscope. For the quantative examination, if the preliminary tests show silk, wool, and cotton, four swatches weighing each 4 grms. are cut; one is laid aside and the three others are boiled.—*Journal de Pharmacie et de Chimie.*

THE REDUCTION of COPPER SOLUTION BY GLUCOSE* appears first to have been utilized by Trömmer. Frommherz suggested the employment of a citrate to keep the cupric oxide in solution. Modifications of the ordinary alkaline tartrate solution have been devised by Barreswil, Poggiale, Rosenthal, Chevalier, Boussingault, Reveil, Fehling Strohl, Viollette, Magneshahens, Lowenthal, Joulie, Pos soz, etc. Loewe employed glycerin instead of a tartrate. Various treatments of the precipitated cuprous oxide have been proposed by the following chemists: Mohr dissolves the oxide in hydrochloric acid, and titrates with permanganate. Brunner dissolves in an acid solution of ferric chloride, and estimates the reduced iron by bichromate or permanganate. Champion and Pellet dissolve the precipitate in hydrochloric acid and chlorate of potassium, boil off free chlorine, and titrate the liquid with stannous chloride. Girard and Soxhlet reduce the cuprous oxide in hydrogen, and weigh the metallic copper. Muter dries the cuprous oxide at 100° C., and weighs it as Cu_2O. O'Sullivan and other operators ignite the precipitate strongly, and weigh as CuO. Ferdinand-Jean dissolves the cuprous oxide in hydrochloric acid, and weighs the metallic silver precipitated on adding ammoniacal silver nitrate. Maumené uses an excess of copper solution, filters, adds ammonia to the filtrate, and estimates the residual copper by titration with sodium sulphide, for which Perrot substitutes potassium cyanide. Lastly, Pavy adds ammonia to the alkaline cupric solution, and runs in the sugar solution till the hot liquid is decolorized.

* From an Advance-Shee of Allen's "Commercial Organic Analysis," vol. ii.

METEOROLOGICAL REPORT FOR NEW YORK CITY FOR THE WEEK ENDING DEC. 17, 1881.

Latitude 0° 45′ 58″ N.; Longitude 73° 57′ 58″ W.; height of instruments above the ground, 53 feet; above the sea, 97 feet; by self-recording instruments.

DECEMBER.	BAROMETER. MEAN FOR THE DAY. Reduced to Freezing.	BAROMETER. MAXIMUM. Reduced to Freezing.	BAROMETER. MAXIMUM. Time.	BAROMETER. MINIMUM. Reduced to Freezing.	BAROMETER. MINIMUM. Time.	THERMOMETERS. MEAN. Dry Bulb.	THERMOMETERS. MEAN. Wet Bulb.	THERMOMETERS. MAXIMUM. Dry Bulb.	THERMOMETERS. MAXIMUM. Time.	THERMOMETERS. MAXIMUM. Wet Bulb.	THERMOMETERS. MAXIMUM. Time.	THERMOMETERS. MINIMUM. Dry Bulb.	THERMOMETERS. MINIMUM. Time.	THERMOMETERS. MINIMUM. Wet Bulb.	THERMOMETERS. MINIMUM. Time.	MAXI'M In Sun
Sunday, 11	30.432	30.476	12 p. m.	30.362	0 a. m.	27.0	25.7	31	4 p. m.	29	4 p. m.	20	7 a. m.	20	7 a. m.	93.
Monday, 12	30.292	30.476	0 a. m.	30.110	12 p. m.	38.0	36.0	45	6 p. m.	43	6 p. m.	29	6 a. m.	29	6 a. m.	74.
Tuesday, 13	30.021	30.110	0 a. m.	29.938	12 p. m.	51.3	47.6	59	12 p. m.	54	12 p. m.	41	5 a. m.	40	5 a. m.	95.
Wednesday, 14	29.806	29.938	0 a. m.	29.688	4 p. m.	56.3	52.7	67	4 a. m.	60	4 p m.	40	12 p. m.	40	12 p. m.	69.
Thursday, 15	30.177	30.322	12 p. m.	29.900	0 a. m.	30.3	29.6	40	0 p. m.	40	0 a. m.	26	12 p. m.	26	12 p. m.	60.
Friday, 16	30.427	30.492	11 a. m.	30.322	0 a. m.	24.0	23.0	29	11 p. m.	28	11 p. m.	18	7 a. m.	18	7 a. m.	92.
Saturday, 17	30.232	30.396	0 a. m.	30.176	12 p. m.	33.7	31.3	40	0 a. m.	36	4 p. m.	25	4 a. m.	25	4 a. m.	88.

		Dry.	Wet.
Mean for the week	30.198 inches.	37.2 degrees	35.1 degrees.
Maximum for the week	30.492 "	67. " at 4 pm 14th,	60. "
Minimum " at	29.688 "	18. " at 7 am 16th,	18. "
Range	.804 "	49. "	42.

DECEMBER.	WIND. DIRECTION. 7 a. m.	2 p. m.	9 p. m.	VELOCITY IN MILES. Distance for the Day.	FORCE IN LBS. PER SQR. FEET. Max.	Time.	HYGROMETER. FORCE OF VAPOR. 7 a. m.	2 p. m.	9 p. m.	RELATIVE HUMIDITY. 7 a. m.	2 p. m.	9 p. m.	CLOUDS. CLEAR, 0 OVERCAST, 10. 7 a. m.	2 p. m.	9 p. m.	RAIN AND *SNOW. DEPTH OF RAIN AND SNOW IN INCHES. Time of Beginning.	Time of Ending.	Duration h. m	Amount of water	OZONE.
Sunday, 11	n. w.	w.	s. w.	125	1½	4.30 pm	.108	.130	.137	100	78	79	0	4 cir. cu.	2 cir. cu.	-----	-----	-----	--	0
Monday, 12	e.	s.	s. w.	187	7	7.20 pm	.149	.177	.244	89	66	91	9 cu.	10	10	7 pm	10 pm	3.00	.03	0
Tuesday, 13	s. w.	w. s. w.	w. s. w.	274	6¾	3 50 pm	.244	.282	.336	91	67	70	10	4 cir. cu.	5 cu.	-----	-----	-----	--	0
Wednesday, 14	s. w.	s. w.	n. n. e.	303	6	10.50 am	.367	.420	.288	71	68	100	8 cu.	9 cu.	10	9 am	12 pm	15.00	.40	10
Thursday, 15	n. w.	n.	n. n. w.	238	4½	3.15 am	.181	.137	.153	100	79	100	10	8 cir. cu.	0	0 am	8.30 am	8.30	.40	9
Friday, 16	n. n. e.	n. n. e.	n. w.	128	2	2.20 am	.098	.106	.136	100	75	88	0	0	0	-----	-----	-----	--	0
Saturday, 17	w. s. w.	w. s. w.	w.	263	3¼	3.00 pm	.141	.144	.157	100	63	71	1 cir.	2 cir.	0	-----	-----	-----	--	0

Distance traveled during the week	1,518	miles.	Total amount of water for the week .83 inch.
Maximum force	7	lbs.	Duration of rain 1 day, 2 hours, 30 minutes.

* Thursday, 15th, 1¼.

DANIEL DRAPER, Ph. D.

Director Meteorological Observatory of the Department of Public Parks, New York.