Correspondence.

Advantages of Salt Water Mains.

To the Editor of the SCIENTIFIC AMERICAN:

Let me call to your attention another possible use for salt water in case it is introduced into this city for fire protection.

Salt water, as is well known, freezes at a much lower temperature than fresh water, and could be used in winter to flush the streets and carry away slush and snow. Fresh water has been used for this purpose, but is limited in its usefulness to mild days, for when the temperature is below freezing, it rapidly forms into ice.

C. MESSICK, JR.

New York, March 31, 1904.

A Letter from Dr. Herty on the Gathering of Turpentine.

To the Editor of the SCIENTIFIC AMERICAN:

My attention has been called to a communication in your issue of February 6, entitled "About the New Method of Gathering Turpentine."

The experiments of your correspondent, Mr. George W. Colin, in the use of detachable boxes, are historically interesting. His assumption, however, of the impracticability of any plan because of the failure of his experiments, scarcely needs comment other than a statement of the fact that at the present time there are at least three million cups in use by turpentine operators, and that this number would easily have been eight million, had the potteries been able to supply the actual demand in time for the present season.

Your correspondent quotes from an article in your issue of January 2 the statement, "New Method of Gathering Turpentine Invented by Dr. Charles H. Herty, and by him given to the public."

I am unwilling to receive credit for generosity which does not properly belong to me, and consequently feel that I should further add that the new system of cup and gutters devised by me has been patented, as it was devised by me before entering the service of the Bureau of Forestry; but the bureau, while recognizing my personal right to the patent, deems it improper for me to receive any royalty on the patent so long as I am officially connected with the bureau.

CHARLES H. HERTY.

Jacksonville, Fla., March 9, 1904.

The Latitudes of Greater New York.

The Greater New York extends through 14 minutes and about 45 seconds of latitude and 28 minutes and about 30 seconds of longitude. The extreme southwestern cape of Staten Island, which is the most southerly point of the city, lies almost exactly 40 degrees, 30 minutes, and 15 seconds north of the equator. The junction of the city line with the Hudson River on the edge of Yonkers, which is the most northerly point of the city, lies almost exactly 40 degrees, 54 minutes, and 55 seconds north of the equator. The western edge of Staten Island marks the most westerly point of the city. It is as nearly as may be 74 degrees, 15 minutes, and 30 seconds west from Greenwich, while the extremity of City Island, which is the most easterly point of the city, lies almost exactly 73 degrees and 47 minutes west from Greenwich.

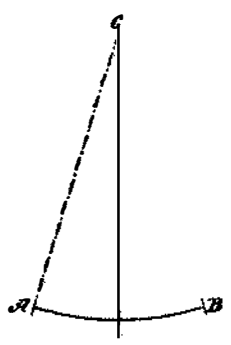
The difference in latitude between the extremes of the city, taken with the difference in elevation and the presence of the sea in the southern part, makes an appreciable difference in climate. There is decidedly more snow and a somewhat lower average winter temperature on the edge of Yonkers than at the southwestern extremity of Staten Island. While the highest point of the city is the ridge near the center of Staten Island, where the elevation at several points exceeds 400 feet above sea level, the general elevation in the upper portion of the city is considerably greater than that of the parts south of Central Park. The highest point on the island of Manhattan is on the wooded ridge overlooking the Hudson at a point nearly due west of Washington Bridge, where the elevation is nearly 260 feet above sea level. A little further north the island reaches a height varying from 180 to 240 feet. The vegetation on this elevated ridge shows the influence of the height above sea level. It suggests the vegetation of the Palisades. The elevations of the Bronx reach 180 and 200 feet in Van Cortlandt Park and in parts immediately southwest of the park. The highest elevation in Bronx Park is just short of 150 feet, and of Pelham Bay Park, about 120 feet.

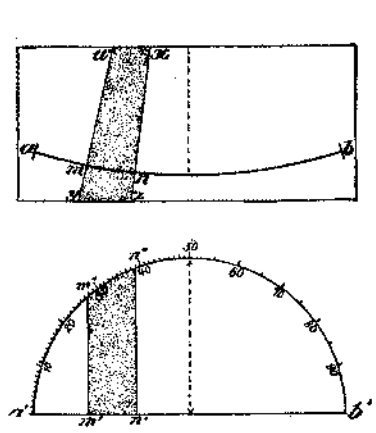
The coolest summer climate of the city is probably the central ridge of Staten Island, where, in the region which is intended for part of the proposed Richmond County park system, the greatest height is 413 feet above sea level. With a stiff sea breeze blowing, these heights are deliciously cool in midsummer. The valleys of the Borough of the Bronx are extremely hot in summer, though the heights are cooler than the built-up portion of the city down town. The narrow strip along the Hudson at the base of the high ridge of the island is one of the hottest parts of the city on summer afternoons, when the sun strikes from the west against the slope of the ridge and is reflected from the burnished mirror of the river.

The lower part of Manhattan and the boroughs of Brooklyn, Queens, and Richmond have rather more rain than the Borough of the Bronx. It snows occasionally in the upper part of the Bronx when only rain falls in the lower part of the city, and snow lies often for days and sometimes for weeks upon elevated parts of the Bronx after it has utterly disappeared from the parts of the city immediately bordering upon the harbor.—N. Y. Times.

METHOD OF TIMING PHOTOGRAPHIC SHUTTERS.

One of the simplest and most practical methods for determining the speed of a photographic shutter is that which has been lately devised by M. L. Pelleport, a French photographer. A nail is driven in the wall at *C*, and from this hangs a pendulum formed of a ball on the end of a string, which should swing freely near the wall. The arc, *AB*, is traced, with *C* as a center, by holding a piece of chalk against the cord, and the limits of the arc, *A* and *B*, are clearly defined by a short mark. The camera is focused upon the arc, *AB*, so as to have as large an image as possible, excluding the point, *C*. The pendulum is drawn to one end of the arc and then allowed to swing, the shutter being opened at the same moment. The photograph appears somewhat as in the second diagram, showing the arc, *ab*, and a grayish band, *wxyz*, the image of the successive positions occupied by the pendulum during the time the shutter is open. A straight line, *a'b'*, is drawn, having the same length as the arc, *ab*, and upon it is erected a half-circle, which is divided





PHOTOGRAPHIC SHUTTER.

into a certain number of parts, say 100. On the base line lay off the distances, $a'm'=am$ and $a'n'=an$, and erect the perpendiculars, $m'm''$ and $n'n''$. The number of divisions in the arc, $m''n''$, compared with the whole number on the semi-circumference, shows what fraction of the length of the pendulum's oscillation the shutter has remained open. To find the time, it is only necessary to know the time of oscillation, which is deduced from the length of the pendulum. For convenience, a second's pendulum may be used. The method, depending upon the physical formula, $\sqrt{\frac{e}{g}}$ is only strictly correct for infinitely small oscillations, but gives a close enough approximation for ordinary use.

The international cup race for motor boats, to be held on July 30, will be participated in by representatives of the United States, England, and France. America has two entries. England and France have more than the allotted three, and will hold elimination trials. S. F. Edge has two launches under way for the English trials. They will be made of bronze. One is forty feet in length and will be equipped with a 120-horse-power engine. The other is thirty-five feet in length with proportionate horse-power. Another English entry is that of Lord Howard de Walden, a wealthy peer and enthusiastic automobilist. France has entered a boat of 150 horse-power of the Gardiner-Serpollet type. Steam will be the motive power of this. The displacement will be twice that of the other boats. On this account the powerful craft may not stand much show. Another French entry is that of G. Peter, a builder of motor boats, regarding which no particulars are given.

Electrical Notes.

An experiment performed by Dr. A. Ludwig has demonstrated the possibility of melting carbon and maintaining it in the liquid condition. The heating was effected under great pressure in the electric furnace, and a curious phenomenon noticed at 1,500 atmospheres was that after a brief failure of the arc, the current refused to pass even when the voltage was much increased. It is supposed that as the carbon passed into the liquid and transparent state, it assumed a rare allotropic form, becoming a non-conductor. The test was too brief for a study of this condition, but was made to include a sudden cooling of the molten carbon by a flooding with water of the interior of the pressure vessel. Though minute diamonds were recognized in the gray powder thus obtained, the result was not wholly satisfactory.

Shortly after the Paris disaster, a commission was appointed for taking such precautions as would be likely to increase the safety of service on the Berlin underground railway. These precautions have now for the greater part been carried out. The lighting circuit of the tunnel has been enlarged by additional independent wires, enabling, in the case of one half of the lamps being injured, the second half to go on burning. The ticket boxes on the underground railway stations are so designed as to be readily pushed aside. The number of fire hydrants has been increased, and each car has been fitted with a sand box. There are bucket fire extinguishers in each car, as well as in the tunnel at distances apart of 328 feet. Each station has been connected to the fire brigade alarm line. The emergency lamps in the cars are prevented from any contact with the curtains, the latter being, moreover, of a heavy, impregnated, wool stuff. Each motorman's stand is provided with short-circuiting devices which may be operated from within the car, and made to cut the current off the line.

Cost of water-power development depends, in large measure, on the location of the electric station that is to be operated. The form of such a station, its cost, and the type of generating apparatus to be employed are also much influenced by the site selected for it. This site may be exactly at, or far removed from, the point where water that is to pass through the wheels is diverted from its natural course. A unique example of a location of the former kind is to be found near Burlington, Vt., where the electric station is itself a dam, being built entirely across the natural bed of one arm of the Winooski River at a point where an island near its center divides the stream into two parts. The river at this point has cut its way down through solid rock, leaving perpendicular walls on either side. Up from the ledge that forms the bed of the stream, and into the rocky walls, the power station, about 110 feet long, is built. The up-stream wall of this station is built after the fashion of a dam, and is reinforced by the down-stream wall, and the water flows directly through the power station by way of the wheels. A construction of this sort is all that could well be attained in the way of economy, there being neither canal nor long penstocks, and only one wall of a power house apart from the dam. On the other hand, the location of a station directly across the bed of a river in this way makes it impossible to protect the machinery if the up-stream wall, which acts as the dam, should ever give way. The peculiar natural conditions favorable to the construction just considered are seldom found.—A. D. Adams in Cassier's Magazine.

The Current Supplement.

The current SUPPLEMENT, No. 1475, opens with an instructive article by Mr. Randolph I. Geare, describing the Smithsonian exhibits for the St. Louis Exposition. It is the purpose of the Editor to publish in the SUPPLEMENT what may well be considered a manual of radium technology, to run through three numbers. The first installment of the paper appears in the current SUPPLEMENT. Mr. Harlan I. Smith discusses in an interesting way the methods of collecting anthropological material. "A Chat About Spoons" is the title of an article that gives many a curious bit of information. Of interest to electricians are articles on the electrolytic refining of lead, the first electric trunk railroad in Great Britain, and the magneto-elastic detector. Mr. H. M. Riseley writes on "Electricity and Mule Power on Canals."

It is said that the Pullman Palace Car Company is about to introduce a sleeper which, from a sanitary standpoint, will be a considerable improvement over that hitherto used on the railroads of the country. The new standard is severely plain and is devoid of all scroll and grill work. The upholstery of the car has been reduced materially and all the angles possible have been taken from the car. Imported mohair has been adopted as a standard curtain and the entire design of the decoration and furnishing is planned with a view to minimizing the work of cleaning the car and preventing the lodgment of germs.