## Communications.

### Our Washington Correspondence.

*To the Editor of the Scientific American :*

In a previous letter I mentioned a decision of the Commissioner of Patents in the matter of Mr. Sargent's application for a patent on combined time and combination locks, awarding priority to Sargent. Since that decision the attorneys for the Yale Lock Co., the opposing party, have filed a bill in the Supreme Court of the District of Columbia to try the title to the invention *de novo*, and subsequently made a motion before the Commissioner to suspend the issue of the patent to Sargent until the termination of the suit, which motion has been granted.

For two or three years past some of the Virginian farmers have been complaining of what they called the "root disease" in their wheat, and this season some of them wrote to the Commissioner of Agriculture requesting him to send some one down to investigate the matter. Professor Taylor, the microscopist of the department, was accordingly sent to examine into the matter, and after spending some days there returned and reported that no such disease as was reported existed. From his investigation it appears that the soil in the locality said to be infected with the disease was simply worn out, and that the report of the disease is said to have arisen from the fact that one of the farmers, observing barren spots in his wheat fields, examined the roots of his wheat at such points and discovered what seemed to him a peculiar web-like appearance, which he supposed to be of fungoid character; and this explanation of the presence of such barren spots appears to have been accepted without question by so many others that the "root disease" came to be considered as an established fact; and in some places farmers had abandoned wheat growing on account of it. Professor Taylor examined this supposed fungoid matter with the microscope, and found it to consist only of the minute rootlets of the plant itself. An examination of the wheat growing on the barren spots and that on more favored localities developed the fact that, the more vigorous the plants, the more of these rootlets there were, showing conclusively that this supposed "root disease" was no cause for the barren places. Mr. Taylor is convinced that the barren spots referred to are due solely to the lack of nutriment in the soil, and that the failure of wheat in such places, which really has formed the only ground of complaint, may easily be remedied by the use of fertilizers and proper treatment of the soil.

The monitor Wyandotte, just manned and equipped at our Navy Yard, was on the verge of going into commission and about to put off to sea, when it was suddenly discovered that she was leaking badly along one of the seams from near her bow to aft of the turret. A board of survey was at once formed, which, after due examination, condemned her as unseaworthy. It seems rather curious how a leak of the extent reported should fail to be discovered until the vessel was all ready for sea.

Several experiments have recently been conducted on the United States steamer Hartford by Captain S. B. Luce, with a patent magneto-electric lamp, which it is proposed to introduce into the navy for distant signalling at night, detecting the approach of boats or torpedoes, picking up buoys, etc. The lamp produces a steady light for three and a half hours, which is visible for fifteen miles. One has been purchased for the Hartford, which will be used for further experiments to determine as to the advisability of introducing these lamps into general use in the navy.

Some time since the Treasury appointed several commissions to examine the question of the rates of drawback on the exportations of sugars and syrups refined from imported raw sugars, and the following are the recommendations of the Baltimore, Boston, and New York commissions:

The majority of the Baltimore Commission recommend that the existing rates of drawback, namely, $3\frac{60}{100}$ cents per lb. on refined hard sugar; 3 cents per lb. on soft, 20 D. S., in color; $2\frac{1}{2}$ cents per lb. on soft, below 20 D. S.; and $6\frac{1}{4}$ cents per gallon on syrup, be left unchanged. The minority report of the same commission recommends that for hard sugars produced by refiners using raw sugars known as "Centrifugals" and "Vacuum Pan," a reduction of $\frac{5}{100}$ of a cent be made from the present for each per centum of raw sugars of that description operated upon. This would make the drawback on hard sugars produced wholly from this class of raw sugars $3\frac{10}{100}$ cents per lb. The Boston Commission recommended the following rates: On hard sugars, $4\frac{18}{100}$ cents per lb.; on soft, above No. 20 D. S., $2\frac{58}{100}$ cents per lb.; and on syrup, $6\frac{1}{4}$ cents per gallon. The rates recommended by the New York Commission are as follows: On hard sugars, 3 cents per lb.; on soft sugars, above No. 20 D. S., $2\frac{1}{2}$ cents per lb.; on soft, No. 20 and below, $2\frac{10}{100}$ cents per lb.; and on syrup, $5\frac{1}{4}$ cents per gallon.

The Bureau of Statistics report that during the month of June there were exported from the United States 2,832,116 yards of colored and 7,855,309 yards of uncolored cotton cloths, which with other cotton goods exported are valued at $939,831. During the past fiscal year, the total value of cotton goods exported was $10,180,984. During the preceding year the total amounted only to $7,722,978.

A short time since the Treasury advertised for bids for printing bank checks at so much per thousand, and there was so much rivalry between the American Phototype Company and the Graphic Company that each of them determined to get it if possible. The Phototype Company bid for the job at $\frac{1}{100}$ of a mill per thousand; and the Graphic, not to be beaten, offered to do it for nothing, and the contract was awarded to the latter as the lowest bidder. The Phototype Company now appear by counsel before Assistant Secretary French and ask that the contract made with the Graphic Company be set aside, on the ground that the bid of the latter was not in accordance with the terms of the advertisement, which called for bids "at so much per thousand," and that "nothing" was not so much per thousand. The Secretary has not given his decision yet, but it is believed he will differ from the learned counsel of the Phototype Company.

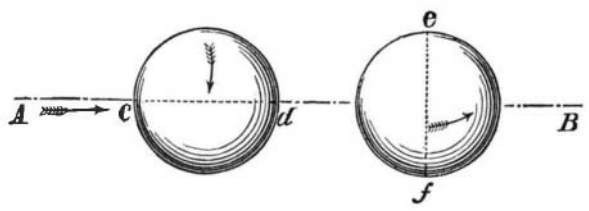
Washington, D. C. OCCASIONAL.

### Curving a Base Ball.

*To the Editor of the Scientific American :*

I see by a reply to one of your correspondents that you seem to doubt the possibility of this feat. That a ball may be thrown with a curve seems to be an undisputed proposition among players, and it may, I think, be accounted for on the principle of unequal momenta of different parts of the ball.

Let us suppose that the ball is thrown in the direction A B, as shown in the cut, with no attempt at a curve. It will




probably leave the pitcher's hand spinning on an axis, *c d*, in the direction of the arrow. Assuming this axis to be perfectly horizontal, the ball will move in a straight line to B, or rather in a parabola in a vertical plane. Now suppose the pitcher, on letting go the ball, to bring the axis, *c d*, to the position, *e f*, perpendicular to *c d*. Then the motion is in the direction of the arrow around *e f*. The posterior half of the ball, *ef*, has two motions, its motion of revolution and its forward motion. The forces which produce these motions being in opposite directions, the momentum of the side will be produced by the difference of their resultants. The anterior half, however, must be influenced by the sum of the resultants of its similar forces, and hence have a superior momentum. And also the side having the least momentum would affect the ball so as to draw it in its own direction. Hence the ball, which is supposed to be thrown toward B directly, would curve off and strike at a point left of B.

By throwing the ball in such a manner that the axis, *c d*, would attain the position, *e f*, at a point a little beyond the middle of its course, the first half of its trajectory would be nearly straight, and it would curve off on the second. By varying the direction of revolution other curves may be produced. My theory is perhaps not correct, but it is the only one which appears at all satisfactory to me.

New Haven, Conn. H. C.

### Rotation in Motion.

*To the Editor of the Scientific American :*

In making calculations for the path of projectiles until quite recently no account has been taken of rotation. If we are to speak correctly no projectile ever describes a parabola, and yet the parabolic curve is made the basis of calculation for all practice in gunnery.

The resistance of the air is no inconsiderable element in calculating the paths of projectiles. But rotation adds another element of even greater importance coupled with atmospheric resistance. It was probably first brought to notice by a series of experiments in gunnery with a smooth-bored piece. In leaving room about the ball for windage it was noticed that the ball balloted from side to side in passing out the piece. The last ballot gave the ball a backward rotation on the side of its tangency, and consequently a forward rotation on the free side. At the same time the ball was deflected out of its course by the last touch, but the accumulated resistance of the air on that side deflects it back again. Thus if a ball last ballots upon the right side it receives a right hand rotation (looking down upon it) about a perpendicular axis. At the same time by touching it is deflected from its course to the left. But owing to its right hand rotation the left side of the ball comes in contact with more molecules of air than the right, and encounters greater resistance. The compression of the air on that side deflects the ball to the right. Hence the ball describes a curve aside from the so-called parabolic curve. If the ball had balloted last on the left side it would have received a left hand rotation and first been deflected to the right and afterwards curved to the left, on account of greater resistance of the air on its left. By balloting on the bottom last it would first rise and then fall, and by balloting on the top last it would fall and afterward rise. Thus it is possible with a smooth-bored gun to shoot round a near object and hit a remote object when both are in a right line.

A ball may be thrown from the hand so as to show the same remarkable effect of rotation. By throwing the ball so as to retard the motion on the left side as the ball leaves the hand, the ball receives a left hand rotation; if the angular velocity is as great as the velocity of translation, the left side meets almost no resistance, while the right meets a double resistance equal to both angular and forward. The air is compressed ahead and to the right of the ball, and it is deflected toward the left. Sometimes this deflection amounts to five or six feet in a course of fifty feet. If the ball is thrown with a right hand rotation it comes round to the right. If a forward rotation (like that of a ball rolled along the floor) the ball will curve down much sooner than it would acted upon by gravity alone. If the rotation be backward, the ball will curve upward until gravity overcomes its initial velocity, and it does not begin to fall as soon as when acted on by gravity alone. J. G. MCMURPHY.

Racine, Wis.

### An Artificial Summer Shower.

*To the Editor of the Scientific American:*

A few weeks ago, while thinking with some anxiety of the dangers which the approaching hot weather might bring to his teething child, the idea occurred to the writer that the temperature of a heated room might be lowered by keeping the window awnings saturated with water or any volatile fluid.

By this means not only would the air which entered the windows be cooled by contact with the cool wet surface of the canvas but also by evaporation of the moisture from the awnings. Accordingly, on the following day, a brass tube having an internal diameter of $\frac{1}{4}$ of an inch was so placed that it would lie across the outside surface of the awning at a distance of a few inches from the upper edge, which is attached by hooks and rings to the house. The ends of the tube, being bent at right angles to the tube, hung down by the sides of the awning about 6 inches. All along the side of the tube which touched the awning were drilled, at intervals of 3 inches, holes about the size of a pin. One end of the brass tube was closed and over the other end was slipped a small india rubber tube. This tube was carried in at the open window and connected by an ordinary screw coupling to the nearest cold water faucet. The awnings of three windows of the nursery having been supplied with this simple apparatus, the water was turned on, and, after passing through the rubber tubing, escaped through the perforations in the metal tubes and, flowing evenly over the front and sides of the awnings, dripped upon the tin roof of the porch below the windows—a miniature summer shower. In a short time a refreshing coolness and moisture of the atmosphere reminded one of breezes blowing into the windows from off the surface of a lake. A thermometer hung outside of the window under the awning, while still dry, showed a temperature of $97\frac{1}{2}°$ Fah. Upon turning the water on, the mercury sank in 15 minutes to 90° Fah., the thermometer still hanging below the awning, but protected from contact with the water. A still more marked effect might be produced by passing the rubber tube through a pail of broken ice. The apparatus is inexpensive; the amount of water used is small, while the comfort it might bring to a sick child or a feeble invalid might be very great. The apparatus does not interfere with the raising or lowering of the awning; and should the dripping be objectionable where there is no roof below to receive it, a small gutter of canvas or metal could readily be attached to the lower edge of the awning to carry off the water; or a smaller flow of water may be used, enough only to keep the canvas moist.

Morristown, N. J. HENRY N. DODGE, M.D.

### India Rubber Hose.

*To the Editor of the Scientific American :*

It seems to me that a little more care in the manufacture of rubber hose would double, treble, quadruple its value. It is lined with a thin coat of rubber, which is supposed to be so perfect in its continuity as to protect the cotton body of the hose from water, but it is not so. There are many points in it where water finds its way through, so that the cotton duck, of which the body of the hose is made, soon decays.

I have a large quantity of inch and a quarter garden hose, two or three years old, that has become quite troublesome. Each piece of hose is fifty feet long, and in each length there will be two, three, four, or more spots where the water will break through, although the bad parts are not a tenth part of the whole, that is, of the entire length of the hose; the lining membrane of rubber seems to be perfect in at least nine tenths of it. Why cannot the other tenth be made perfect? It seems to me the additional cost of manufacture would be very little more, but the value of the hose would be at least doubled.

Portland, Me. N. D.

### Fish from an Artesian Well.

At a recent meeting of the San Francisco Academy of Sciences, specimens of fish, supposed to be trout, were presented, accompanied by a letter from Thomas R. Bard, of Hueneme, Ventura county, Cal. They were thrown up from an artesian well 141 feet deep near that place. The well, which is nearly 300 feet deep from high water mark, was bored in 1871, and ever since has thrown out immense quantities of freshly spawned fish in April and May. The first fish this year were observed in March. The well is capped, having three two-inch apertures, from one of which people were in the habit of filling barrels of water for household uses. In that way the presence of fish was discovered in 1872. The cap was removed and fish were ejected in incredible quantities, until the cap was replaced. The fish are said to be of various sizes, the largest about an inch in length. The nearest stream where fish are found is Santa Paula Creek, twenty-five miles from the well, but it empties in the Santa Clara river, at a point twenty miles distant.