Correspondence.

Home-made Indian Clubs Very Cheap.

To the Editor of the Scientific American:

The following inexpensive substitutes for Indian clubs will be appreciated by those who have not had the advantages of a good gymnasium open to them.

Take a couple of these dark green ale bottles, clean and dry well. Then put in each enough dry sand to make required weight, either 2, 3, 4, or 5 pounds, as required. Now fill the remaining space with sawdust, pack tight and cork.

The bottles can be obtained from any junk dealer for a few cents each, and the grocery will weigh out the sand (silver), at a cost of about five cents a quart. Ten cents apiece would be an outside price for the largest.

The bottles, as a last precaution, should be wrapped in cotton or cloth, and only these strong *champagne* bottles should be used in any case.

AUDLEY H. STOW.

435 Mount St., Baltimore, Aug. 1, 1886.

The Art of Pitching in Baseball.

To the Editor of the Scientific American:

In your issue of this date I notice an article on curve pitching by Mr. Henry Chadwick. I hate to say anything to knock a man's pet theory out, but if Mr. C. will consult his "curve pitcher" again, he will, I think, be assured that his arrows show a rotation in a direction exactly opposite to the one necessary to produce a given curve.

E. g., in his diagram, cut A, with the ball moving in the direction BC, and rotating as shown, the ball curves to the pitcher's left, or is an *out* curve to a right-handed batter, and can be produced as in cut C, as stated. The opposite rotation is an "in," as in cut B. Any pitcher that ever "watched the ball" will, I know, agree with me. In cut D, the rotations should be changed around. I held up his theory myself until I found it conflicted with the facts of the case.

The side of the ball most retarded by atmospheric friction is invariably the side that goes *farthest*, and this is done as well when the axis of rotation is *parallel* to the ground, as it must be in the rise and drop balls nowadays so effective in keeping the base hit column low.

BALL PLAYER.

Ann Arbor, July 31, 1886.

The Art of Pitching in Baseball.

To the Editor of the Scientific American:

In the article on the "Art of Pitching in Baseball," SCIENTIFIC AMERICAN for July 31, Mr. Chadwick misstates the case. The rotation of the ball is, no doubt, the cause of its curving. But, as an *actual fact*, it does not curve as stated by him. "If," he says, "the ball (cut A) (or, strictly, its center of gravity) is moving forward (let us say at the rate of 100 ft. per second), and at the same time it is revolving so that points on its equator are traveling around its center at an equal rate, it is evident that D is traveling *backward* as fast as the ball, as a whole, moves forward; while I is moving forward at its own rate, *plus* that of the center—that is, twice as fast as E. As the friction of the air increases with the velocity of the moving object, it must be greatest at I and least at D, being really zero at D under the conditions given. The I side of the ball is, therefore, retarded more than the center or any other part, while the D side suffers no retardation. The result must be a curve *toward* the retarded side." Now, Mr. Editor, it is an *actual fact* that the curve is *from* the retarded side *to* the side of least resistance. In cut A, the curve is from I to H, and *not* from D to H, the pitcher standing at B, as stated by Mr. Chadwick; therefore, his deductions are not correct. His explanation of cut A is correct. The air is densest at P, and gradually decreases in density to H, where it may be called medium. From there it decreases to D, where it is normal. From I to H there is a constant pressure on that side so much greater than on the side H to D that the ball is pushed over away from I. The rotation of the ball is piling up—so to speak—the air at P, and causing a pressure there. This column of air or resistance is in the shape of a wedge of air, and forces the ball away from it. If you throw a ball over the surface of water, it will *richochet*, the water being denser. So the rotation of the ball makes a denser medium, and the ball leaves it, and as it is producing it all the time, the movement is continuous. Mr. Chadwick's description of how the rotation of the ball is accomplished is about correct. I would state I have made these curves myself, and did not find it a difficult matter.

A. G. EASTON.

St. Louis, July 30, 1886.

The Niagara Suspension Bridge.

The stone composing the four towers of the Niagara Railroad Suspension Bridge having been found to be slowly disintegrating, it has been decided to replace them by iron supports. Although a difficult and possibly dangerous undertaking, the work is being carried on without much interference with the use of the bridge. Every precaution has been taken to prevent accident. The workmen are now engaged in removing stone from the sides of the towers, in order to make room for the preliminary ironwork. The upper caps are being drilled, so that when the time comes, the hydraulic jacks may be readily slipped into place and the great cables transferred from the stone supports to the strong iron towers which are to replace them. These are being manufactured in Detroit, and will shortly be shipped to Niagara. Their cost will be $40,000.

PHOTOGRAPHIC NOTES.

Labeling Bottles.—In a paper read by C. H. Bothamley before the Leeds Photographic Society, embracing several useful subjects, we take the following concerning labels for bottles as published in the *Photographic News:*

In order to render paper labels durable, the name, etc., should be written with Chinese ink, and the label, after fixing, sized twice with a solution of gelatine or good glue. It should then have two coats of copal varnish. Labels treated in this way will last for years. If a label is required which can be read by transmitted light, nothing is simpler or more efficient than ordinary black varnish, which can be applied with a pen or camel's hair brush. After some time, the varnish may show a tendency to chip off; but it can easily be renewed. For bottles containing acids or caustic alkalies, the varnish is in all cases much better than paper labels.

Preparing Solutions.—When making up solutions of definite strength, it is important to remember that the volume of the solution is greater than the volume of the water used, but less than the sum of the volumes of the solid and the solvent before solution; for example, to dissolve one ounce of ammonium bromide in ten ounces of water does not make a ten per cent solution, because the volume of the solution is greater than ten ounces. In order to obtain a real ten per cent solution—*i. e.*, a solution which contains one part by weight of the salt in ten parts by measure of the solution—the one ounce of ammonium bromide should be dissolved in five or six ounces of water, and the volume of the solution then made up to ten ounces by adding more water. Similarly, a twenty per cent solution of hypo is made by dissolving twenty ounces of hypo in forty to fifty ounces of water, and then making the total volume up to 100 ounces.

Considerable time may be saved, and the operation of making up solutions much simplified, by determining, once for all, the capacities of the bottles in which the solutions are kept, and marking, by means of a writing diamond or black varnish, or in some other way, the point to which a bottle must be filled in order that it may contain 5, 10, 20, or 100 ounces, as the case may be. This is done, of course, by pouring the measure volume of water into the bottle, and marking the height at which it stands. Suppose, for instance, we have a bottle which holds 10 ounces of a 10 per cent solution of ammonium bromide, and it is required to make up a fresh quantity of solution. All that is necessary is to weigh out one ounce of the salt, transfer it to the bottle, add some water, and, when the salt is completely dissolved, fill up the bottle to the mark.

Recovering Residues.—The recovery of residues is often neglected, especially by amateurs, from a belief that it is a very troublesome matter; but if a large quantity of work is done, and especially if the plates used are of considerable size, the residues will be of no little value, and as a matter of fact the operations necessary for their recovery are very simple. The only solutions which any but workers on the largest scale need keep are the fixing bath from the plates, the fixing bath from the silver prints, and the first washings from the prints. In addition to these, there will be the clippings from the silver paper, and any waste prints.

The silver solutions may be all mixed together, and the silver precipitated in the form of sulphide by adding a solution of sodium sulphide. The sulphide is a dense black precipitate insoluble in hypo, and settles somewhat rapidly. When the precipitate has settled, the clear liquid may be drawn or poured off, and a fresh quantity of the silver solutions put into the same vessel and treated in the same way. When a sufficient quantity of silver sulphide has accumulated, it is dried, heated strongly, and then fused in a clay crucible with five or six times its weight of a dry mixture of sodium carbonate and borax, when a regulus of metallic silver is obtained; or the dried precipitate may be sent to the assayer.

Removal of Films from Plates.—The removal of old films from gelatine plates is most easily effected by soaking the plates in a mixture of 1 part commercial hydrochloric acid and 50 parts of water. In a short time the film will frill off the plate.

Stoppers for Varnish Bottles.—Every experienced photographer knows the troubles which arise from the use of corks in varnish bottles. The cork becomes cemented to the neck, and either breaks in the process of removal, or leaves small fragments of cork adhering to the inside of the neck, to say nothing of the fragments which fall into the varnish and render filtration necessary. Bottles with glass caps ground to fit can be purchased, but they are somewhat expensive; and, moreover, if a drop of varnish finds its way between the cap and the bottle, and is left there, it cements the two firmly together. The following plan will be found cheap and efficient: An ordinary bottle with a fairly long neck is taken, and a thick cylindrical ring of India rubber is slipped over the neck down to the junction of the neck with the bottle, care being taken that the India rubber projects beyond the well of the neck. A short wide test tube fits on the ring, and forms a cap to the bottle.

Intensifying Negatives.—Notwithstanding the various methods which have been proposed for intensifying gelatine negatives, mercurial intensification still holds its own, in spite of its defects. The removal of hypo, which is essential to success in this as in most other processes of intensification, is best effected by soaking the well washed negative in water to every 5 ounces of which has been added about 1 drachm of a 20 volume solution of hydrogen peroxide, as recommended by Abney. Next in efficiency to the peroxide comes alum acidified with hydrochloric or, better, citric acid. The plate is soaked in this for a considerable time, then washed, and allowed to dry with free exposure to air. The oxidizing action of the air during drying completes the work of the acidified alum, and converts the traces of hypo into non-reducing substances. Brown stains, however, sometimes make their appearance on negatives from which it is almost absolutely certain that every trace of hypo has been removed. According to Mr. Spiller, the staining is due to an insoluble compound of mercuric chloride and gelatine, and he states that the formation of this compound can be prevented by adding ½ drachm of concentrated hydrochloric acid to every 20 ounces of saturated mercuric chloride solution. It is not, however, advisable to use a saturated solution of mercuric chloride, as is generally recommended; a 2½ per cent solution acts more evenly, and is better under control. I find that much clearer and better results are obtained if the plate, after being taken from the mercury solution, and rinsed well with water, is placed for five to ten minutes in a 5 per cent solution of ammonium chloride. The use of this salt in the mercury solution has previously been recommended by England. Its effect is doubtless due to the partial solubility of the mercuric compounds in ammonium chloride. With regard to the relative merits of ammonia and sodium sulphite for the after treatment, it may be said that with the latter there is less risk of stains, but the intensification is not so great as with the former, since the metallic mercury reduced by the sulphite is not so opaque as the dimercuroso-ammonium chloride formed by the action of the ammonia. Theoretically, if the sulphite is used, it is possible, by a repetition of the process, to increase the intensification, and, in fact, to build up an image of metallic mercury. As a matter of practice, I find that the increased intensification which can be got in this way is only very slight. When ammonia is used, the strength of the solution does not exert any great influence on the result. The stronger the ammonia, the greater is the quantity of silver chloride removed from the film, and hence the intensification is somewhat weaker.

A Simple Remedy for Chronic Diarrhœa.

Dr. T. C. Smith, writing in the *Med. and Surg. Reporter*, June 12, 1886, mentions the fact of his having cured a case of chronic diarrhœa, which had lasted for nearly forty years, by the administration of a saturated solution of salt and cider vinegar, a drachm being taken three or four times a day. He also states that since the first instance where he recommended this homely remedy, without supposing that it would actually do any good, he has employed it several times in more or less severe cases of chronic diarrhœa, in which it produced great improvement, and, in some cases, cure. Where relapses followed the suspension of the remedy, its renewed administration was again followed by improvement.

Hastening of Leather Tanning.

In a process patented in Germany on Dec. 8, 1885 (Ger. pat. 36,015), J. S. Billwiller, of St. Gallen, Switzerland, proposes that the softened, unhaired, and purified skins be alternately treated with dilute solutions of sulphate of alumina and bicarbonate of soda. This operation must be frequently repeated. If, however, a solution of sulphate of alumina, as neutral as possible, be employed, more concentrated solutions can be employed, and it suffices then to adopt a single treatment with each solution. The hides thus swollen, and filled with aluminum hydrate, are then freed by a quick wash with dilute hydrochloric acid, and then with water, from the aluminum hydrate separated out on the surface. They are then tanned out in the tan solutions. Seeing that the hydrate of alumina combines with a portion of the tannin to form aluminum tannate, the tanning process is very greatly expedited.