

PHOTOGRAPHIC NOTES.

Advantages of the Hydrochinon Developer.—In a series of experiments as to the relative value of the pyro and hydrochinon developers, conducted by W. B. Bolton and described in the *British Journal of Photography*, he finds, in using hydrochinon without any preservative like sulphite of soda, it acts fully as fast as pyro and produces no stain. He dissolved one grain of hydrochinon in one ounce of water. At the end of twenty-four hours it was of a deep brown sherry color bordering on a red or pink tinge, yet perfectly clear and bright. The solution at the end of twelve days was tried on a plate and yielded excellent negatives. He found it particularly useful for undertoned plates, since it gave more body or density to the film without a trace of fog than is the case with pyro. Ammonia was used as the alkali. Regarding its advantages he says:

"As regards quality of image in the sense of freedom from stain, there was, except in two or three of the longest exposures, no chance of comparison between the two developers. With the shortest exposures, even, there was practically no stain with hydrochinon, while the forcing necessary produced in the case of pyro very deep brown coloration, but, of course, as the time of exposure increased, and that of development was curtailed, the staining became less and less, and in the longest exposures the large proportion of bromide used assisted to preserve tolerable purity.

"So far as keeping the film clear from stain is concerned, I am free to admit that these experiments were not conducted as the actual development of so many negatives would, perhaps, have been, *i. e.*, with the addition of sulphite. But it must be borne in mind that the charge brought against hydrochinon was that, while much slower than pyro, it possessed no advantage over the latter in cleanness. The proper course then was to try them on their merits, and this I endeavored to do, giving pyro, if anything, the advantage. The result shows that hydrochinon is, under the circumstances, quite as rapid as pyro and much cleaner; and I think it will scarcely be claimed by anybody that if sulphite had been used to keep the pyro clean, its rapidity would have been increased.

"It is impossible, fairly, to compare two developers under precisely identical conditions, as in this case, at least, 'What is sauce for the goose is not sauce for the gander.' To wit, I maintain that though bromide and sulphite are advantages and benefits to pyro, they are unnecessary and a drag in the case of hydrochinon. I hold, in fact, that the proper use of hydrochinon lies in employing it, under normal circumstances, at least, without any such adventitious aids or hindrances; or if it be necessary to preserve for lengthened periods in solution, to use a minimum of nitric or citric acid as the preservative in place of sulphite."

Hydrochinon Developer.—According to the *Photo. News*, M. Balagny, of Paris, France, prefers the following as an excellent developer for instantaneous exposures:

Water.....	10	ozs.
Sulphite of soda (crystals).....	6	drms.
Hydrochinon.....	50	grs.
Carbonate of soda in crystals.....	1½	ozs.

The hydrochinon must be completely dissolved before the carbonate of soda is added; if any little grains are left undissolved, the addition of the alkali will cause the solution to be at first reddened, and later on rendered unserviceable.

For ordinary exposures a mixture of equal proportions of a new and old developer is advised. In copying engravings and other work of a similar character, an old developer only should be employed.

To convert a new developer so that it will have the effect of an old one, add to each three ounces 20 drops of glacial acetic acid, to which mixture 3 ounces of water may or may not be added. A fresh bath will develop five or six instantaneous exposed plates in succession. A great point in favor of hydrochinon is the latitude of exposure which is permissible without any alteration of the developer. Plates exposed varying from two to twelve seconds all came out equally well. Balagny advises the use of glass or porcelain trays, finding that the black or rubber trays in common use are liable to discolor the solution.

Photographic Congress.—An international congress, to be under the especial management of the French Photographic Society, is expected to be held in Paris during the summer of 1889, having in view mainly the securing of uniformity of several things pertaining to photography, among them being the fixing of a standard light, standard sizes and threads of lens mounts, and methods of determining in some uniform way the sensitiveness of commercial plates.

Permanency of Bromide Prints.—In developing bromide paper with the ferrous oxalate developer, it has come to be the practice, after the developer has been poured off, to immediately flow over the print a dilute solution of acetic acid and water, which dissolves any iron salts remaining in the film and produces clear whites. The *British Journal of Photography* states there is danger in not sufficiently eliminating the acid

effect prior to fixing the print in hyposulphite of soda. This, it recommends, should be avoided by more careful or prolonged washing in water. Then it should be put into a fresh bath of hyposulphite of soda and left there for ten minutes, and perhaps put into a second hypo. bath, and lastly well washed. By this means all of the silver will be converted into a soluble salt, readily removed by soaking in water. If the print is put in the hypo. too soon, sulphurous acid, sulphur, and other deleterious matters are set free in the paper. After a while, when the print is exposed to the light, the paper itself will turn slightly yellow, while the image on its surface remains unchanged.

Items from the Report of the Secretary of War. MILITARY EXAMINATIONS.

It should be borne in mind that it has been and still is the policy of the government to rear and train at West Point young men from all portions of the Republic to be soldiers. No expense is spared to give them the best military education possible. Only those who succeed in passing the tests of rigid examinations are selected for the public service. So severe is the ordeal through which they pass, that but one in three succeeds in graduating. Nor is expense spared in providing for these young men thus educated when they take their places in the army, for the pay of our officers is higher through all its grades than that of any other army save the Anglo-Indian army. And yet, after thus preparing and providing for them, there are no special requirements, common to all, demanding their progress and growth in the profession of arms; and no inquiry is made, or examination had, as the years go by, and they advance, grade after grade, whether as individuals they are worthy of promotion, and are equal to the higher rank and larger responsibilities they are forced to assume. When a second lieutenant enters the service, whether from civil life, the ranks of the army, or from the Military Academy at West Point, the rigid examination above alluded to is made the necessary condition for the commission. But this once passed, under present regulations, the officer can, and but too frequently does, close his books and his studies; and if he does not overwork or expose himself, he knows that, with good health and life, he is certain, under the operation of compulsory retirement, to reach the highest grade open to seniority in his arm of the service.

I assume it to be true in the army, as elsewhere, that no man should occupy a position for which he is not fitted; and it is equally true that there should be some way in the army, as elsewhere, through which such fitness should be ascertained. It should be a professional examination, having reference to the mental, moral, and physical fitness of the candidate. Its object is plain—the advancement and elevation of the service. Surely there can be no reasonable objection to this test on the part of those who will be subjected to it.

Soldiers are developed and matured rapidly on the battle field, but in time of peace it is only by study and application, by practical experiment, by exercise in the use of weapons, and by keeping fully abreast of the world's knowledge, that the soldier can be made ready for his real work, when it comes.

I would therefore suggest for the consideration of Congress that a general law be enacted, with provisions respecting examination similar to those which govern promotion in the navy, with such changes and limitations, in regard to the number of examinations, and to what grades of rank and to what arms of the service they shall be extended, as may be considered necessary in applying the law to the army.

COLLEGE MILITARY INSTRUCTION.

The reports from colleges where army officers are serving as instructors show that effort is made to instruct the students in practical rifle firing, but that the annual allowance of ammunition for this purpose is entirely inadequate. By a generous supply of ammunition to these colleges for target practice it is possible that competitive contests in rifle shooting might, in time, become as popular with some of these inland colleges as boat racing now is at the universities of our seaboard.

THE POTOMAC FLATS.

In execution of the plan projected for this improvement, there has been dredged a channel from 350 to 550 feet wide and 20 feet deep, between Georgetown and Giesboro Point. The Washington channel has been dredged to a width of 350 feet and 20 feet deep, all the material being deposited on the flats, and up to the present time about 544 acres have been reclaimed from the overflow of ordinary high tide. Of the 12,000,000 cubic yards required to raise the flats to the proposed height of three feet above the highest freshets, about 6,511,000 have been deposited. On June 30, 1888, the expenditure for this improvement amounted to \$1,247,495—less than half the estimated cost of the work.

SMALL CALIBER ARMS.

The investigations have been completed to determine the charge and projectile, rifling, chamber, etc., for an arm of smaller caliber than the present ser-

vice piece. It is the intention to use compressed and perforated cartridges, but as yet the powder makers have not succeeded in producing a satisfactory powder, the desired velocity being accompanied by too great a pressure. This matter of a suitable powder is still under study and trial. The results obtained in France with the Lebel rifle seem to point to a radical change in the manufacture of powder for small arms.

THE 8-INCH BREECH LOADER.

The firing of the 8-inch breech-loading gun has been continued during the past year as rapidly as suitable powders could be procured and as other important work would permit. Much delay has occurred from the failure of the powder makers to reproduce or duplicate powders accepted as satisfactory. The gun has been fired 203 rounds, and is in sound and serviceable condition. This firing has produced light but distinctly visible erosion marks on the front slope of the powder chamber, the shot chamber, and the bottom of the rifled bore. The firing will be continued until the endurance is thoroughly tested. Experience indicates that the erosion increases rapidly as the pressures increase, and the pressures during the test of this 8-inch gun have averaged over 16 tons, and reached as high as 22 tons, per square inch of powder chamber. The gun is in the hands of the board for testing rifled cannon and projectiles, and its report will be rendered during the coming year.

CAST IRON BREECH-LOADING MORTARS.

The 12-inch breech-loading rifled mortar, cast iron, hooped with steel, has been subjected to preliminary firing by the Ordnance Board, with the object of determining suitable kinds and weights of charge, to cover all ranges from 1 to 6 miles, without exceeding the prescribed limit of pressure, and to ascertain the best form of banding for the projectiles. This firing is not completed, and the results thus far obtained can hardly be accepted as the best to be expected from this piece. In all, about 193 rounds were fired, of which 78 rounds were with charges of from 50 to 80 pounds, with an average pressure of about 28,000 pounds, but reaching as high as 33,000 pounds per square inch. The maximum charge is not less than 80 pounds brown prismatic powder; density of loading, 1.113; weight of shell, 630 pounds; maximum velocity, 1,152 feet; energy, 5,796 foot tons. The range attained with this charge and weight of shell under an angle of 45 degrees was 10,480 yards, or 5.95 miles.

It is the intention to subject the mortar to a fire of endurance of not less than 400 rounds, of which 200 shall be with the maximum charge or in which the pressure shall be a maximum. It is the intention to use a stronger powder for the maximum charge, to give a pressure of about 30,000 pounds, with a velocity of about 1,175 feet. The present mounting of the mortar, as regards both carriage and platform, is unsatisfactory, and the firings for accuracy at long range will have to be postponed until a new platform can be laid. No firings for rapidity have as yet been made, and at this date it may be said that the accuracy of fire, endurance, and power are not definitely determined except as to the minimum limit.

CAST IRON RIFLES.

The manufacture of the two 12-inch breech-loading rifles, cast iron tubed, and cast iron hooped and tubed, after having been suspended for nearly two years, owing to the failure of the contractors to complete them within the lifetime of the appropriation, was resumed this spring, Congress having reappropriated the money to pay for them, and having also extended the contracts. The 12-inch breech-loading rifle, cast iron hooped and tubed, has been completed and sent to the proving ground; the other gun, the 12-inch breech-loading rifle, cast iron tubed, will probably be completed by next December.

PNEUMATIC DYNAMITE GUNS.

Under the provisions of the army bill for the procurement of pneumatic dynamite guns, the necessary specifications are now being prepared, and advertisements for proposals will issue early in December. The guns will probably be of 15 inches caliber and throw a projectile that will carry a charge, each, of about 500 pounds of explosive gelatine, with full caliber projectiles. The guns will probably be delivered in from six to ten months from the date of the contract, so that all the guns of this class that can be procured under the provisions of the law will be purchased during the coming year 1889.

Bichloride of Mercury as a Preventive for Cholera.

During his recent residence in Tonquin, M. A. Yvert successfully employed this preparation for the cure of cholera in doses varying from 0.02 to 0.04 grain in twenty-four hours. Of forty-five patients so treated nine only succumbed, or about 20 per 100, the normal rate in that region as in Europe being 66 per 100. It was also administered to convalescents in districts where the epidemic had again broken out and had already made one victim. None of those who took this preventive medicine was attacked.