

out knowing the why or the wherefore of it. Suppose I give the uses of a few of the commonest chemicals and what effects they produce. First, of course, comes the pyro or metol or whatever agent is employed. Without them the developer would not act; yet too much or too little is just as bad as none at all. Too much will produce a clogging of the whites and make an altogether excessive contrast, while on the other hand, too little will result in prolonged development and a lack of vigor and brilliancy. There are many developing substances such as pyro, eikonogen, metol, hydrochinone, glycine and others, which hasten development, and so quickly intensify the high lights that the shadows remain behind and do not get

On the other hand, of course, too little will retard the action of the solution. You must bear in mind that granulated sodas are twice as strong as crystals, and also that old and dry crystals are considerably stronger than fresh, as the water of crystallization gradually evaporates. The most convenient way to work is to make up saturated solutions, and then, when you want to use them, all that is necessary is to add water to a portion thereof until the hydrometer reads at the desired degree. This makes no difference if dried chemicals are used instead of crystals. When they are prepared by weight, however, proper attention must be paid to the relative strengths of the chemicals. Bear well in mind that twelve parts of



ABOVE GRASSY LAKE.

The North Branch, White River at extreme low water.—the lowest known, it is said, for fifty years.

their proper amount of detail brought out. A little over exposure, dull lighting or soft working plate is of good service here. Or it is possible that the developer may be diluted with water, and development so held back that the shadows will have a chance to work through before the high lights have gained too much strength.

Passing on to the alkalis, we find that their mission is to soften the film and open the pores so that the pyro, or whatever agent be employed, will get a chance to act. This will show you the object of soaking an under-exposed plate in sulphite and carbonate of soda. In ordinary use, however, care must be taken not to use too much of it, else the agent, acting too fast, will make the negative too dense and cause granulation.

carbonate of sodium crystals (sal. soda), are equal to five parts of carbonate of sodium dried, or to six parts of carbonate of potassium, and two parts of sulphite of sodium crystals are equal to one part of the dried or granular sulphite. Roughly speaking, one ounce of dried or anhydrous soda is equivalent to about two ounces crystals. When dissolving dried sulphate or carbonate of sodium, the water ought to be vigorously stirred with a glass rod while adding the powdered chemicals to cause a speedy solution and prevent the formation of a solid lump. The carbonates of soda are added to give the agent employed the alkalinity necessary for action, while the use of the sulphite is to prevent discoloration and decomposition. It is very important, therefore, that these chemicals be perfectly pure. Also,