

4. Wash off all the free nitrate of silver, and pour over the film a preservative composed of 25 grains of gum arabic freshly dissolved in an ounce of water. Let it dry spontaneously, and before putting the plate into the dark slide, dry it again thoroughly before a hot flat iron.

5. Give the same exposure as for wet collodion.

6. Develop the picture by first wetting it with distilled water, and then pouring over it a developer consisting of 1 ounce of distilled water, 2 grains of pyrogallic acid, 2 scruples of glacial acetic acid, and a few drops of a weak solution of nitrate of silver. The image appears immediately, and very soon acquires the necessary intensity.

7. Fix the negative in the usual way with a saturated solution of the hyposulphite of soda or lime, and when dry varnish it with spirit varnish.

Negatives taken in this way are equal in every respect to those taken upon wet collodion plates, and the process is as simple as any of those which are now employed for slow dry plates.

Upon the reading of the above paper, Mr. Maxwell F. Lyte made the following remarks:—

"My experience having been somewhat considerable in the use of dry collodion, I venture to make a few remarks on that subject. There is no doubt of the fact that a combination of bromide with the iodide of silver is decidedly advantageous as an accelerator in the case of sensitive dried films of collodion; but that this introduction of bromine should in any way be looked upon as new, when employed in this manner, is a mistake. Bromides have been very long employed in landscape photography, as a useful adjunct. One thing seems certain, that where greens form one of the prevailing colors in the picture, their impression is most decidedly facilitated. The proportion of bromide proposed to be introduced is, in my opinion, rather too large—one part in four of iodide being the proportion which I find to work best. The use of gum arabic as a preservative coating, combined, with a very small portion of honey, was mentioned by me in the journal of the Photographic Society of Paris many years since, but subsequently discarded as giving a tendency to fog; but perhaps my decision in this respect may have been hurried, as I may not have washed the plate thoroughly enough, and certainly the proposed acid nitrate bath in which Mr. Sutton renders his plates sensitive, is likely to diminish this fogging tendency. This fogging it was which induced me to substitute the metagelatin for the gum arabic, which I subsequently did. Now, however, I am led to believe that the following modification of the resin process employed by the Abbe Desprats is the simplest and best process for dry collodion:—Add to the collodion one-fifth per cent of the resin of scammony, that which has been purified and bleached with animal black is to be preferred. Sensitize in a bath of seven per cent nitrate of silver, slightly acidulated with acetic or nitric acid; wash the plate thoroughly in clean rain or distilled water, to which has been added 0.1 per thousand of common salt or chloride of ammonium, and let the plate become dry in a place thoroughly free from dust. The exposure is less than that required with any other dry process with which I am acquainted, and is not above one-half more than that required for moist plates. The development should be performed by first moistening the plate with distilled water, and then pouring on a solution containing one part of pyrogallic acid, ten of acetic acid (glacial), and five hundred of water. Fix with a solution containing about one of cyanide of potassium to a hundred of water. It is not absolutely necessary to employ for the first washing bath distilled or rain water, with an addition of chloride. The second washing should always be performed in water as pure as can be obtained—in distilled water if possible—and especially the presence of any bicarbonates is to be avoided. Gum arabic is the lime salt of a very weak acid. In contact with nitrate of silver it is decomposed, with formation of the gummate of silver; but no such double decomposition takes place when it is placed in contact with the bromide or the iodide of silver. The action of light, however, on these latter compounds is to eliminate their acid element and separate the silver, and the iodide and bromide set free would tend to fix themselves on the lime in the gum. If the washing be not thoroughly performed, however, gummate of

silver will form, which blackens in contact with the developer, even without previous exposure to light. It is, therefore, with much propriety that Mr. Sutton insists on a careful washing of the plate after sensitizing and previous to the application of the gum."

THE GRAPE CURE.

Germany is distinguished for originating several curative systems which have become popular "all the world over." Homeopathy and hydropathy are now very generally practiced in the treatment of many diseases to which poor humanity is subject. But there is another system practiced in Germany which has not yet become general, nor is it very widely known, but which deserves attention, as it appears to be based upon common sense principles. One reason for its practice being still limited is owing to the fact, that it cannot well be practiced but in vine-growing districts; still as there are many of these in America, it may be practical in various sections of our country. The system consists in the treatment of patients with grapes, as constituting the most of their diet for a certain period. It is also practiced with a due regard to living in a healthy and beautiful locality, and combining with this pleasant exercise in the open air. Durkheim on the left bank of the Rhine, in the Bavarian Palatinate, is the headquarters of the grape cure in Germany. There are other places where it is also practiced, such as at Vevay and Montreux on the Lake of Geneva, also Meran in the Tyrol, but Durkheim enjoys the most fame. The vine is cultivated to a wonderful extent in that district, but the grapes are principally used for the table, and are not so highly esteemed for making wine as some others. About fifteen different sorts of grapes are cultivated at Durkheim, but those which are most commonly used for the treatment of patients are of two sorts, called the Gutedel and the Austrian. They are both white; their skins are very thin, and they are sweet and well-flavored. The black Burgundy grape, and the small dark-red Framiner grape are also used to a moderate extent. The former is similar to the black Hamburg, which is well known in America; the latter is a sweet aromatic grape, little known among us. The Riessling grape, from which the most celebrated Rhine wines are made, is not used in the cure, as it is not held to be a good table grape. The sweetest grapes are always chosen, as an excess of acid interferes with digestion, and it also affects the teeth and mouth injuriously. The acids in grapes are the tartaric, malic and citric. There are also albumen, gelatine, gum, tannin, the oxide of iron and potash in grapes. Durkheim is a fashionable watering-place, like Saratoga, where persons congregate to partake of the mineral water for the restoration of health. The grape cure season commences about the middle of September and lasts nearly to the end of October. Persons afflicted with bronchitis, pneumonia, a scrofulous constitution and tubercular consumption in its earlier stages, come to Durkheim yearly from all parts of Germany. It is a beautiful place, and at the castle there is a garden where the invalids congregate in the open air and where a band of music plays at the regular hours appointed for eating the grapes. Each invalid with a small basket in his hand goes up to the tables where the grapes are sold and purchases the quantity which he intends to eat. The amount taken daily by persons undergoing the cure varies from three to nine pounds, and they are sold for about five cents per pound. Persons commence with eating about three pounds per day and gradually advance to the limits of their appetite. It is usual to eat them three times a day, namely, at seven in the morning with tea or coffee and some bread for breakfast; at eleven o'clock the greatest quantity is taken; then between five and six in the afternoon the last meal is served up. The skins and seeds are not usually swallowed. Butter, fats, pastry and spiced meats are forbidden to the invalids. A free use of the grape is probably beneficial in the alleviation of many diseases. The action of the vegetable juices upon the human system is but very improperly understood. It is only by experience that the truth can be found out; but the use of the grape—the fruit of fruits—is so natural that the grape cure commends itself to our common sense. As the

grape is becoming very extensively cultivated in several sections of America, we expect that at no distant day we will have such villages among us as Durkheim. The first object to secure their success is the cultivation of the right kind of grapes.

A free use of the grape is looked upon with favor by many of the most sensible doctors in Germany. It is customary with them to send many of their patients to the grape cure districts, just as many of our physicians advise consumptive persons to seek more favorable climes in search of health.

Drawing and Rolling Metals.

Dr. Robison, in the *Encyclopædia Britannica*, remarks:—"It is a very curious and inexplicable fact, that by forging a metal, or by frequently drawing it through a smooth hole in a steel plate, its cohesion is greatly increased. This operation undoubtedly deranges the natural situation of the particles. They are squeezed closer together in one direction; but it is not in the direction in which they resist the fracture. In this direction they are rather separated to a greater distance. The general density, however, is augmented in all of them except lead, which grows rather rarer by wire drawing; but its cohesion may be more than tripled by this operation. Gold, silver and brass have their cohesion nearly tripled; copper and iron have it more than doubled. In this operation they also grow much harder. It is proper to heat them to redness after drawing a little. This is called annealing. It softens the metal again, and renders it susceptible of another drawing, without risk of cracking in the operation." Mr. Kirkaldy, of Glasgow, agrees with Dr. Robison as to cohesion and hardness, but avers that he was in error in stating that the general density is augmented. Instead of an increase, there was a proved decrease in the specific gravity of 0.70 per cent. in the bar specimen, and 0.36 per cent. in the plate specimen produced by the process of cold rolling. The most highly-converted steel does not, as some may imagine, possess the greatest density, the hardest steel being only 7.8152, whereas the softest is 7.8220. The specific gravity of puddled steel is less than that of some of the superior kinds of wrought iron.

Mr. Kirkaldy's experiment tallies very nearly with the received formula for the breaking strain of wrought iron. Here is his condensed table:—

	Highest.	Lowest.	Mean.	Tons.
	lbs.	lbs.	lbs.	
188 bars, rolled...	68,848	44,584	57,555	25½
72 angle iron....	63,715	37,909	54,729	24½
167 plates, length-ways.....	62,544	37,474	50,737	} 25½
160 plates, cross-ways.....	60,756	32,450	46,171	

The breaking strain of 25 tons for bars and 20 tons for plates must be considered in reference to the working strain, or the load which can with safety be applied in actual practice. The working strain is estimated at a third to a tenth of the breaking strain. The British Board of Trade limits the strain to five tons, or 11,200 lbs. per square inch.

A FARMER at Haubaurain, France, has been trying experiments with cod-liver oil in the fattening of calves, pigs and sheep. He gave two ounces to each pig daily, one ounce to each sheep, and an ounce and a half to each calf. The oil was mixed with bran and chopped straw for the calves, with bruised beans for the sheep, and with kitchen refuse for the pigs. In ninety days all the animals thus fed were fattened to a degree far beyond expectation; their meat was white, tender and easy of digestion.

SILVER IN PHOTOGRAPHY.—Mr. Spiller, the superintendent of the Chemical Department at Woolwich, England, states that a full sized sheet of albumenized paper requires 50 grains of the nitrate of silver, but ten grains of it only are expended, and the rest may be recovered from the solutions. The actual cost for silver does not really exceed two or three cents per sheet, and the other chemicals required amount to about the same.

A POOR CORPORATION.—The New York *Evening Post* says:—We understand that the New York Gas Company has privately declared a cash dividend of 100 per cent, as well as a scrip dividend of 33 per cent. This is the concern which alleges that it is too poor to pay the Government tax, and seeks to extort it from the consumers of their gas!