Correspondence.

Coloring of Flowers by Absorption.

To the Editor of the Scientific American :

In the last number of the SCIENTIFIC AMERICAN, under the heading "Flowers Colored by Absorption," it is stated that "the process of coloring flowers by the absorption of dyes through the stem" is the discovery of Mr. Nesbitt.

Two years ago Mr. C. B. Riker showed me several field daisies colored by placing their cut stems in aniline violet ink. They refused to absorb any color from black ink.

Mr. J. M. Foote, of Newark, made experiments of a similar nature twenty years ago, which are even more curious, inasmuch as he colored peonies as they grew by applying various dyes in solution to the ground in which they stood, obtaining five or six different colors, and also finding them to refuse certain colors.

Both the above experiments probably antedate Mr. Nesbitt's.

DURAND WOODMAN.

South Orange, N. J., September 3, 1883.

The Locomotive Whistle.

To the Editor of the Scientific American :

In your issue of 18th inst., page 99, I notice, with much surprise, your observations on sounds—distances at which locomotive whistles, etc., can be heard. From my own observation I know that the sound of a locomotive whistle can be heard much further than 3,300 yards. Many times, on calm nights, I have heard distinctly the whistle of an engine —locomotive—*seven miles*, air line measurement; and parties of undoubted veracity tell me that they have heard the sound *ten miles* distant. The noise of passing trains on the Weldon road, six miles (10,560 yards) away, is perfectly audible on calm nights. Why, any of our robust negroes could be heard calling hogs, on a calm morning, 3,300 yards distant! and the voices of my students at play during recess have been heard a *mile* from the academy.

This part of North Carolina is very level, and sparsely timbered; this may, perhaps, account for the great distances at which sounds can be heard.

DAVID L. ELLIS,
Principal of Falling Creek Academy.

Goldsboro, N. C., August 28, 1883.

Novel Spectacles for Near-sighted People.

To the Editor of the Scientific American:

Having passed forty, I require to read with comfort No. 11 near-sighted glasses. I can read at six inches without, or at twenty inches with No. 8, but reading, and especially writing, is very uncomfortable, so I bought a pair of No. 11 eyeglasses, and for the day it was eyeglasses and spectacles, spectacles and eyeglasses—a regular monkey and parrot time of it. Necessity being the mother of invention, I pressed for a solution and found it. My left eye is so afflicted with myopia that I cannot use any number whatever to advantage, and so call on it only for guard duty, and poor at that. I concluded that this misfortune could be turned to good account by putting a No. 11 glass in the left eye frame and a No. 8 in the right, and "presto!" when I want to look or walk, pop go my eyeglasses proper face forward. When I want to read or write, I reverse the order, and No. 8 goes to my left eye and No. 11 to the right. Result—spectacles are carefully laid aside as mementos of twenty years' faithful service, and I am happy, as I believe many of your readers might be who are likewise afflicted.

M.

Pittsburg, Pa., September, 1883.

Dollar Weights and Measures.

To the Editor of the Scientific American :

It is a duty man owes to his fellow to add to his comforts, conveniences, etc. Accepting this view as correct, I have determined to publish to the world my (I believe) new plan for weights and measures in the United States. By my plan we only need one table in our schools of arithmetic instead of all the various ones now in use. Avoirdupois, troy, apothecaries', land, and other measures and weights will or may be abolished and this one table substituted. Besides, my plan will confine a large amount of business and trade to our own country in the shape of printing, milling, etc. It will save many hours of study to our youths at school, thus enabling them to acquire a more extended education. I suppose the benefits which would accrue would for a long time be almost incalculable. This is not the thought of a moment. It is the result of the study of years. I have consulted some fine minds concerning it, and all approve it.

The plan is to have a certain accurate weight and measurement for our silver dollar. Then everything can be measured by it, and "standard weights and measures," which now cost heavily to Government and the States individually, will be unnecessary. Thus:

10 mills make	1 cent.
10 cents make	1 dime.
10 dimes make	1 dollar.
10 dollars make	1 eagle.

Now, ten silver dollars are about 15 inches long; 9½ ounces in weight (av.); 1 ounce of distilled water at 60° Fahrenheit is displaced by 10 dollars. This gives us, viz.:

Measure of length.
Measure of weight.
Measure of capacity.

It being all decimal, the silver coin of the United States can be made to conform to the standard of measures, etc., and we will thus have a uniform standard for weight, measure, and coin, the one being a check on the other.

In the French system there is some danger of error on account of incorrect punctuation. I think that would be avoided in this plan.

The discovery of some better plan than the old one has long been desired, and I believe this plan is all we need.

Suppose we want about a grain of medicine exhibited. There are about 412 grains in a silver dollar. A mill is the one-thousandth of a dollar. Then two mills would represent nearly the weight desired. Suppose we want the weight of a load of coal. If there were 2,000 pounds of coal on the wagon, we would represent that amount by 210 eagles, or, say, 211. Suppose we want to sell a gallon of oil. There are 128 eagles in an oil gallon. We may, if required, add to this nomenclature double eagles, flags, or states, or something to that effect, making use of our own surroundings to designate amounts.

View the question as you may, the decimal system is superior to any, and I believe my system is the best decimal system.

S. HUBBELL.

Lupton, Colo., September, 1883.

Drawing in the Workingmen's School of Berlin.

BY G. HRABOWSKI.

The object of this school is to furnish apprentices and assistants in every trade, during their spare hours, such instruction in drawing, science, and art as shall supplement the practical part which they learn in the shop.

It opened two years and a half ago with 300 pupils, and last winter had 1,013 pupils with 26 teachers, mostly specialists.

A special class was formed for the apprentices of opticians and instrument makers in mathematics, mechanics, physics, and free hand mechanical and technical drawing. Last October the number applying for instruction in drawing was so large that it was found necessary to start a second class. The number of apprentices receiving instruction was 114, each of which paid 6 marks ($1.44) per semester (half year) for 8 hours a week instruction, which comes out of their own salary.

These gratifying results are largely due to the increasing and judicious endeavors of many master workmen [*i. e.*, the men who have the instruction of the apprentices in the shop] to induce apprentices to go to this school, by directing their attention to the advantages of a theoretical knowledge of their own branch. The idea formerly so prevalent, especially among "self-made" masters, that a theoretical education, on the one hand, only made the young workmen conceited and inclined to expect more, and, on the other, that workmen who think do less work and are of less value, has fortunately been entirely overthrown. Absolute indifference, so great as to be manifest, which cares only for getting the most work out of the apprentice as a labor machine, without regard to whether the latter rises to a useful member of the profession or sinks to a mere factory hand, and which has a still worse effect than the other idea, is now so rarely noticed that we need not dread its influence on the trades.

For constructive workmen drawing is of the greatest importance; it is the application of mathematics. To make something new, to invent something, without drawing, is very difficult, owing to the lack of being able to get a view of it; in fact, it is impossible in making large machines. Engineers and architects could not do half what they do without drawings. Every young man that receives good instruction in drawing will become accustomed to neatness, thoroughness, mathematical habits of thought, a correct and accurate eye, in fact, all good habits that it is important a workman should have, and his dexterity will increase and the taste for beautiful and graceful forms be cultivated. Drawing, which has hitherto received too little attention in the schools, is the very branch of art that is most valuable to the artisan.

The pupils have received such varied previous preparation that it is necessary to give each one personal attention and individual instruction. Class instruction by lectures and blackboard drawing would not be feasible, as less advanced pupils could not keep up and the more advanced would be held back.

The drawings are not made, as is unfortunately still the case in many schools, from other drawings, but from the objects themselves, or from problems given out by the teacher. A mechanical drawing copied from another one, although it is very easy to get nice, clean drawings in this way, is of much less value than drawing from actual models, in which the pupil exercises his eyes more and must use his understanding.

The first drawings that the pupils in the special classes make, after they learn to draw with dividers, are "nets" or sketches of surfaces. The pupils are given the problem of evolving the "net" or drawing the shape in which a piece of foil (or sheet tin) must be cut so as to make a particular object, which has been shown or described to them, with sketches of the correct size of the base, elevation, side, etc.* These exercises are specially suited to the beginner, because he becomes accustomed from the start to mathematical thought in drawing, and also because they can soon be finished, so that his patience is not put to too severe a test, and finally because it gives him an opportunity to learn how to work accurately and neatly with all the drawing utensils, even the brush.

* This experience is also given in Prof. Felix Adler's Workingmen's School in West 54th Street, New York.

In the second stage of instruction, projections are made, besides the well known projection of a screw, the projection of a curved tripod, and of those parts of an instrument that are placed at acute angles, such, for example, as a lens holder, or a microscope stand, which is specially important for instrument makers. Such drawings are generally made on a large scale to render the construction easier.

In the third class, drawings are made from parts of instruments. First, some metallic object bounded by plane surfaces (turned or filed) is employed, then more complicated parts. They are first sketched free hand, as they will subsequently be drawn; then measurements are made of the model and written on the sketch; then the model is put out of sight, and an accurate drawing made according to these measurements.

Afterward, in the fourth class, complete instruments and apparatus are drawn in this manner, except that the preliminary sketches are omitted to save time, as soon as the pupil has learned to make them correctly and draw from them.

The models used for these drawings are not all "sections," nor such as present to the eye the actual cross section; complicated apparatus themselves are used, which the pupils have to take apart so as to be able to draw the section correctly.

Pupils that have gone over these four stages, which can be done in two semesters (one year), and are able to draw any kind of apparatus, even complicated ones, correctly and neatly, from henceforth draw designs for parts of instruments.

The pupils sketch from memory as many parts of instruments as possible that serve the same purpose, for example, joints, systems of axes, arrangements for adjustment, mountings for lenses, mirror and prism holders, and the like.

After the teacher has directed the attention of the pupil to still other approved constructions for parts of instruments and corrected his sketches if necessary, the pupil will make complete drawings from systematically arranged sketches. Other designs, which are made especially by such mechanicians as make optical instruments, are made by those who have completed the regular course, such as graphic representations of simple optical problems that come before the constructive opticians.

All the drawings are made with black India ink, partially with and partially without shading lines; colors are used only on nets and cross sections. The colored borders so commonly employed in machine drawings are not suitable for this work, where the parts of apparatus are often very fine. Then, too, the color conceals any imperfections in the lines, which is very bad for beginners.—*Translated from the Zeitschrift fur Instrumentenkunde.*

Dangers from Impure Water.

Too much reliance is placed on the senses of taste, sight, and smell in determining the character of drinking water. It is a fact which has been repeatedly illustrated that water may be odorless, tasteless, and colorless, and yet be full of danger to those who use it. The recent outbreak of typhoid fever in Newburg, N. Y., is an example, having been caused by water which was clear and without taste or smell. It is also a fact that even a chemical analysis sometimes will fail to show a dangerous contamination of the water, and will always fail to detect the specific poison if the water is infected with discharges of an infectious nature. It is therefore urged that the source of the water supply should be kept free from all possible means of contamination by sewage. It is only in the knowledge of perfect cleanliness that safety is guaranteed.

The local European volunteer health commission in Alexandria, where the cholera has been raging along back, is unearthing, according to the *Sanitary News*, some very unsanitary conditions in that city. They have found a large native cemetery, underneath which runs a canal, with which communicates a well, the water of which is used to wash dead bodies. A drinking fountain adjoins this well, and the canal is the water supply of a crowded portion of the town. In the mosques are stagnant pools of water used for ablutions prescribed by religious belief, the water in which, being unchanged, gets indescribably foul. Such nuisances are difficult to abate because of religious prejudices. Is it any wonder, adds the *News*, that pestilential disease attacks such a locality?

A New England Manufacturing City.

The *Maryland Farmer* publishes a letter from a correspondent who has seen the great cotton mills of Fall River, Mass., and gives some statements which are not generally considered when estimating the relative manufacturing importance of the geographical sections of the country. Fall River has a population of 55,000, according to the last census: it has fifty-three mills for the manufacture of cotton goods, covering an investment of $35,000,000. Fall River has over one-seventh of all the spindles in the country, and manufactures over three-fifths of all the print cloths of the country. This manufacturing city employs 18,135 persons, their pay weekly amounting to $113,000, and the capital stock is reckoned at $16,738,000.