

or Sedges; it is an endogenous plant, with a triangular stem; and to talk about its "inner bark," and "layers" like the coats of an onion, is a simple absurdity. One might as well speak of "the inner bark" of a stalk of Indian corn or of a bulrush. The error has originated from ignorance or forgetfulness of the elements of botany, and the consequent misinterpretation of the passage in Pliny (*Hist. Nat.*, xiii. 11-13, al. 21-27), which is our chief source of information about the ancient manufacture of paper from this plant. One of the words which Pliny uses to describe the very thin strips into which the cellular substance of the stem was sliced in making the paper is *philyra*, which strictly denotes the inner bark of the linden tree, also employed as a writing material. Hence the papyrus has been conceived of as an exogenous plant, with its outer and inner bark, and has actually been called a "tree." The botanists of course have not made such a mistake.

Mr. Abbott points out a still more absurd mistake in the English translation of Guhl & Koner's "Life of the Greeks and Romans," which says: "The stalk . . . was cut longitudinally, after which the outer bark was first taken off; the remaining layers of bark, about twenty in number (*philyrae*), were carefully severed with a pin; and, afterward, the single strips plaited crosswise; by means of pressing and permeating the whole with lime water, the necessary consistency of the material was obtained." The word mis-translated lime water is *Leimwasser*, which means glue water.

#### Nitric Acid Produced by the Electric Light.

Mr. T. Wills, F.C.S., has been making some experiments on the production of oxides of nitrogen in the electric arc. The atmosphere of course consists mainly of oxygen and nitrogen, but simply in a state of mechanical mixture; if these gases become chemically combined, they form several oxides of nitrogen, most of which are strong and corrosive acids. At a high temperature small quantities of these gases can be made to unite. This is the case when electric sparks are passed through air; also during the combustion in air of a very hot flame, such as that of hydrogen; it therefore seemed probable that, as the temperature of the electric arc is undoubtedly very high, nitric acid, or some other oxide of nitrogen, might be produced by the electric light. The first experiment was rather surprising. A glass cylinder placed over an electric lamp (Foucault's regulator) for two minutes, and afterward examined, was seen to contain a perceptible amount of red fumes, due to peroxide of nitrogen ( $N_2O_4$ ). The air surrounding the lamp was next drawn through a solution of potash, and the amount of nitric acid estimated; this gave 10 to 12 grains of nitric acid produced per hour (it may eventually prove to be more, the difficulty being to collect the whole of it). The next step in the research will be to examine the various forms of electric light, with a view to determine the amount of nitric acid produced by each. One of the advantages heretofore claimed for the electric light over gas light has been that the products of combustion of the former were harmless, while gas light produces the deadly carbonic acid.

#### A NEW FIREARM.

The novel firearm shown in the accompanying engraving consists of a short barrel attached to a base plate that slides upon two rods projecting from the handle. The barrel is pressed forward by spiral springs which surround the guide rods. The handle or stock is similar to a saw handle, and contains a lock or spring mechanism which throws the needle forward into the cartridge when the trigger is pulled.

The recoil which follows the discharge of the weapon is taken up by the spiral springs, thus relieving the hand from the shocks which generally follow the discharge of firearms.

This weapon would seem to be especially useful in fighting at close quarters, as in the case of a marine engagement. Its large caliber enables it to carry formidable and effective ammunition, while its length is such that it can be used when rifles and ordinary pistols are useless. Either shot or shells may be used.

This firearm was recently patented by Mr. Jarvis Royal, of Rochelle, Ill., from whom further information may be obtained.

#### Wine from Oranges.

Experiments have recently been in progress in countries ravaged by the phylloxera, in regard to the substitution of orange juice for grape juice in wine making. The first wine made from oranges, in Spain, has just made its appearance in the market of Valencia. Four kinds have been produced, one of them a sparkling wine. They are all said to be of an attractive color, perfectly clear, of an agreeable, sweet, slightly acid flavor, and of an alcoholic strength of about 15 per cent.

#### A Little Seaport's Monopoly.

The little seaport of Scituate, Mass., is almost the only place in the country where "carrageen," or Irish moss, is gathered and cured, although it may be found everywhere along the coast of eastern New England. Scituate is the great center of the moss business, and supplies the entire Union from its beaches. The moss is gathered by means of long rakes into dories, and the wives and daughters of the boatmen prepare it for the market. Everybody knows its

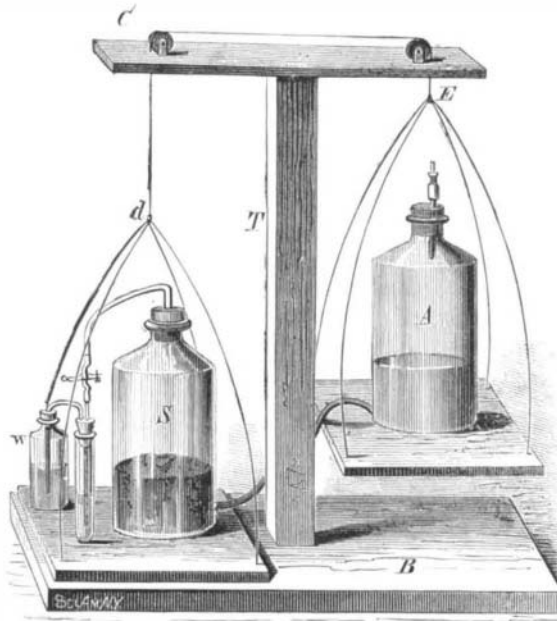
use in jellies and blanc mange, and it is also largely used in the manufacture of lager beer. The annual product is 10,000 or 15,000 barrels, worth to the producers about \$50,000. About 150 families are engaged in harvesting the moss.—*Worcester (Mass.) Spy.*

#### A NEW FORM OF SULPHURETED HYDROGEN APPARATUS.

BY LE R. C. COOLEY, PH.D.

Since hydric sulphide is one of the most indispensable and troublesome of chemical reagents, no apparatus can be more welcome to the chemist than one which is able to yield an abundant supply of this gas and at the same time shield the laboratory from invasion by its disgusting odor.

To furnish the gas at any moment, to generate it only when in use, to retain the excess, which escaping in bubbles from the fluid under examination contaminates the atmos-

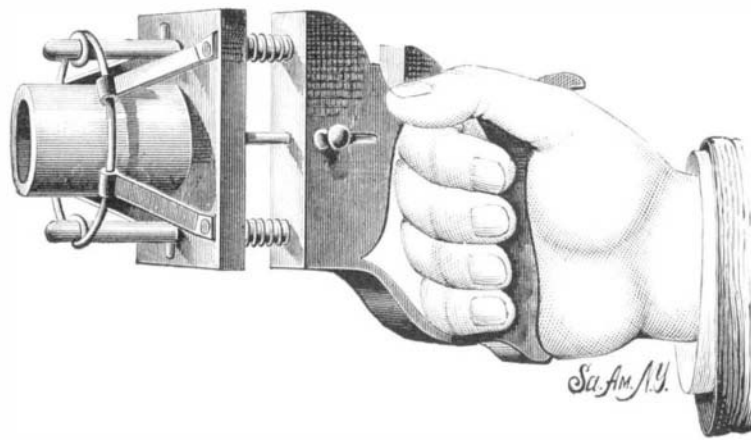


phere, and at the same time to be easily and cheaply constructed and conveniently used; these are the most desirable qualities of the apparatus, but qualities which hitherto have been found very difficult to combine. Believing that no other form is at once so efficient, so nearly odorless, so cheap, and so convenient in use, I offer the following description of an arrangement represented in the accompanying cut:

Notice, first, the plain but strong wooden frame, consisting of the base board, B, the standard, T, supporting the crosspiece, C, on top of which, near its ends, are two iron pulleys.

Notice, next, two platforms, each provided with four stiff curved iron wires, which meeting at the points, D and E, are fastened to the opposite ends of a strong cord passing over the pulleys at the top. By this means the two platforms, like a pair of scale pans, have a free vertical motion.

The materials for generating the gas are placed in two bottles, A and B, one on each platform. These bottles being



ROYAL'S IMPROVED FIREARM.

tubulated near the bottom are connected by means of a piece of thick rubber tubing, which is rendered more impervious to gas by immersion in melted paraffine. The bottle, A, is to be filled to one half its capacity with the dilute acid, while in the other bottle, S, fragments of the ferrous sulphide rest upon a thick layer of broken glass or of silicious pebbles.

The gas bottle, S, is provided with a tightly fitting rubber or paraffined cork stopper, through which passes the delivery tube, which may be opened and closed at pleasure by means of the usual nipper-tap arrangement shown in the cut.

At the lower end of the delivery tube is a long tapering rubber stopper perforated with two holes. One of these holes is lined with a piece of rubber tubing, the ends of which project a little beyond the stopper. The end of the delivery tube is thrust into this rubber tube until it reaches half way through the stopper. This arrangement permits the insertion of a separate piece of glass tube into the lower end of the stopper, by which a solution may be fed with gas, and

its removal for cleansing after each operation. From the other perforation of the stopper a bent tube passes over into a bottle of ammonia water, W. The cut represents this apparatus in operation.

The fluid to be tested is placed in either a test tube or flask. For small quantities the tube is very convenient. The operation is as follows:

Insert the short glass tube into the lower end of the stopper. Press the tube or flask containing the fluid up until its mouth is tightly closed by the tapering stopper. Depress the platform carrying the gas bottle, and carefully open the nipper tap. The acid flowing from the bottle presses the gas from the bottle, S. It bubbles through the liquid in the tube or flask, and the excess then passes over into the bottle, W, where it is completely absorbed by the ammonia. Close the nipper tap, lift the platform carrying the gas bottle, remove the test tube or flask and also the short delivery tube from the stopper; the apparatus is then ready for the next experiment.

Whether the apparatus is used continuously or at intervals, the joints being well made and the foregoing directions carefully followed, the laboratory will be free from the odor of the noxious gas, except that due to the small quantity that remains filling the tube or flask when it is removed.

A single apparatus with bottles of one gallon capacity has furnished the gas needed in the Vassar laboratory for the last three years, the classes numbering from 25 to 50 students. The exhausted acid is easily replaced, and the ammonia removed from time to time, as may be necessary.

#### Brier Root Pipes.

Much of the wood used for making the so-called "brier root" pipes is derived, it appears, from Corsica. The white heath, or *bruyère* (of which "brier" is a corruption), grows in great luxuriance and very abundantly among the trees and shrubs which form what is called the "maquis" covering the mountain sides.

In the course of the last few years, since brier wood pipes have become such a large article of trade, the heath trees have become a source of lucrative industry. The roots are dug up and cut into rough forms of tobacco pipes by circular saws worked by the water power of the mountain streams. The pieces, when cut up, are sent in sacks to France, and thence to America, to be eventually manufactured into "brier root pipes."

#### Cincinnati Faience.

The fine enameled ware known as Cincinnati faience originated with Miss M. Louise McLaughlin, of that city, whose experiments were first successful in 1877. It is fired in a kiln at the temperature of 9,000°, the famed Limoges faience of France being fired to no more 5,400°. The enamel of Cincinnati faience is exceedingly brilliant in color, and so hard that the point of any steel instrument is said to make no impression upon it. This invention is indirectly a result of the excellent schools of design for which Cincinnati is justly honored.

#### New Mechanical Inventions.

Mr. Christian Bissmann, of New York city, has patented an improved Spring Balance that takes up less space than the ordinary weights and pulleys, and by which the raising and lowering of the sash are accomplished easily and without noise.

An improved Alarm Bell has been patented by Mr. Charley H. Smith, of Delphos, Ohio. This is an improved fire alarm, which is simple in construction and is easily and conveniently operated.

An improved Cane Shaving Machine has been patented by Messrs. Charles L. Jones, James W. Smith, and Henry H. Adams, of Gardner, Mass. The object of this invention is to construct a cane splitting machine that will permit of changing the knives without loss of time, and also to make the knives adjustable according to the size of the cylinder.

Mr. Julius Bluemel, of San Francisco, Cal., has patented an improvement in Breech Loading Firearms, the object of which is to obtain rapidity in loading and firing shotguns and rifles, and prevent liability of accidental discharges.

Mr. Hosea T. Stock, of Toledo, O., has patented an improvement in Supporting Frames for Excavating Machines, which can be loaded,

supported, and moved from place to place on a railroad track, upon an ordinary flat or platform car. Only certain portions need be removed in order to enable the apparatus to be transported like an ordinary railroad car.

#### New Caustics.

Two caustics, which promise to be most valuable, have recently been introduced to the notice of the medical profession by Dr. B. W. Richardson. They are sodium and potassium alcohols. When applied to the skin these alcohols are said to cause "gradual destruction of tissue, which may be so moderated as hardly to be perceptible, and may be so intensified as to act almost like a cutting instrument."

These caustics have the advantage that they will dissolve opium, like ordinary alcohol, and also that their action can be stopped immediately by dropping on the eschar a little chloroform, which decomposes the caustic into chloride of the metal and triethyl ether, which is inert locally.