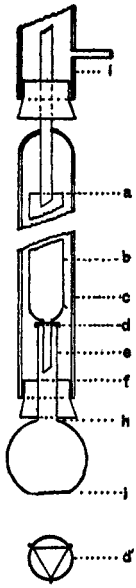
inverted percolator-dome c. The top of the flask neck may be simply rounded in the flame, and the small triangle d d′ arranged to support the shoulder of the tube a b. The length of the flask between points d and h may be any desired distance, but it is suggested that it protrude above the cork f two inches. The cork f requires no previous extraction, as the solvent in contact with it can not enter the flask containing the extract except by volatilization. The flask may be of any desired size, although the ordinary "sugar flask," of 100 cc. capacity, without rim at the mouth, will be found convenient for the greater range of work.




Where it is desired to complete extract solutions to a definite volume the arrangement will be found particularly useful. The apparatus should be sunk in a water-bath to a depth sufficient to prevent accumulation of the solvent upon the cork f. The apparatus is simple and readily adapted to the condenser of the Knorr extractor, shown at l.

Upon completion of the extraction, the cork f is easily removed and the flask wiped and dried without danger or annoyance caused by mercury globules.

## LABORATORY DEVICES.

By Elwyn Waller, Ph.D.

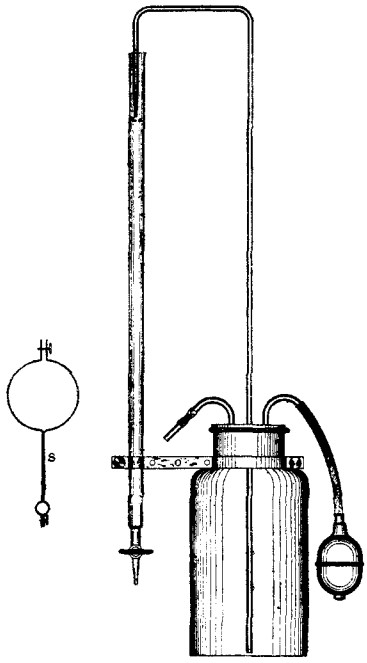
Received October 17, 1894.

DURING the recent general meeting of the Society in Brooklyn, many of the members visited the mineral water establishment of Dr. C. H. Schultz, in New York, and enjoyed his hospitality. After the lunch, the different parts of the plant were inspected by the visitors. In the analytical laboratory were a few forms of apparatus which attracted much attention as they have heretofore not been described. These were the burette-filling device, designed by Dr. A. P. Hallock, the chemist of the factory, the condenser and revolving Nessler rack, adapted by E. W. Martin, of the New York Health Department, and the Nessler comparator as improved by Dr. Hallock.

A description of these may be of service.

BURETTE FILLER.

Around the neck of a bottle of convenient size for the stock solution (capacity two liters or more) is fixed a collar of brass, carrying a clamp for the burette. The collar and clamp are made of two strips of brass bent as shown in the sketch, which are soldered or riveted together at s. The ends are turned outward, and fitted with thumb-screws, to allow the circles to be clamped firmly about the bottle neck and the burette.




The (rubber) cork of the bottle is pierced with three holes. Through one of these passes a tube extending from near the bottom of the bottle to above the top of the burette, then, turning twice at right angles it dips into the burette, being steadied in position there by a cork with a small slit on one side, or fitting loosely. The end of this tube is a little constricted, and cut off at a point corresponding with the zero line of the burette graduation.

Through another hole in the cork passes a short tube connected with an ordinary syringe compression bulb, by means of which air can be forced into the top of the bottle.

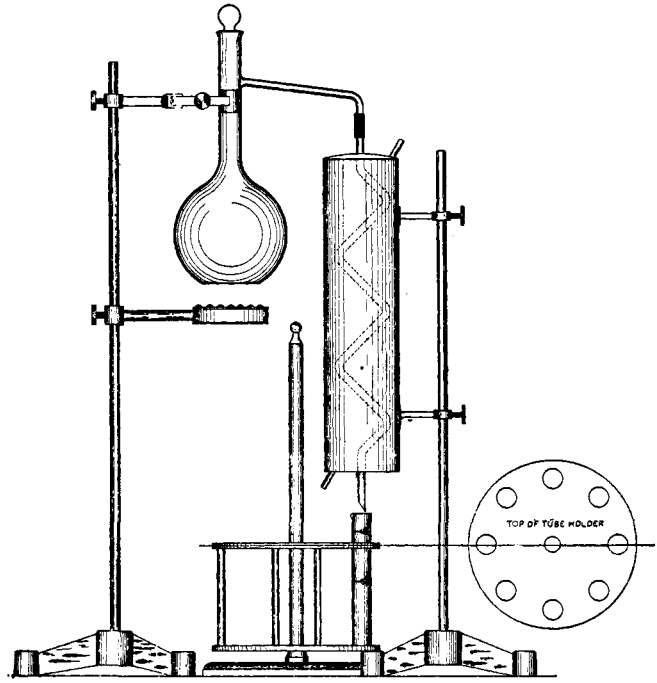
Through the third hole passes another short glass tube, the external end preferably bent downward, so that it may be easily closed by the finger when it may be desired to compress the air in the bottle, or by taking the finger away, the pressure may be at once released.

When it is desired to fill the burette, by closing the air-tube with the finger, and squeezing the bulb a few times, the stock solution is forced over into the burette. As soon as the level of the liquid has come to or above the zero line, the air pressure is released by removing the finger, and all the liquid above the

zero mark siphons back into the stock bottle, leaving the burette filled to the zero mark and ready for use.

The device is simple and comparatively inexpensive, and it has the great advantage that the delivery ("nose") of the burette can be easily fixed at a convenient height above the working table.

Serious objections to most other forms of apparatus constructed for this purpose are, that the delivery of the burette is too high above the working table, or that the stock-bottle has to be fixed




in some elevated position, or that the form of burette which must be used is an elaborate and costly piece of glass-blowing.

### CONDENSER.

For water analysis distillations, etc., a glass-stoppered flask with side-neck tube is used. The end of the side-neck tube is turned vertically downward, being thrust deeply into the tin tube of the condenser, and held in place there by a short piece

of rubber tubing. The three-eighths inch block tin pipe forming the condenser-tube is bent zigzag instead of in the conventional helix. This affords a more even flow of the distillate. The cylindrical copper jacket containing the water for cooling is about four inches in diameter, and fifteen inches long. The disk closing the lower end is *arched upward* so that in case the condenser "sweats" from the use of very cold water, the drip from the outside can not contaminate the distillate. The lower end of the tin tube is cut aslant for the more certain delivery of the distillate.

### REVOLVING NESSLER STAND.

This is simply a whirligig rack made of two circles of thin board connected with light strips of wood, the upper circle perforated to carry eight or ten tubes, the lower partly perforated to form shallow sockets for the tubes. The rack revolves about an upright set in a base. With such a stand as this, if one tube in the rack is placed in position to receive the drip from the condenser, revolving the rack will bring successively every other tube on the stand into the same position. The danger of upsetting or breaking the tubes is practically eliminated, and, moreover, the order in which the fractions of the distillate are taken off is easily preserved.

### NESSLER COMPARATOR.

This has the form of a large test-tube rack of wood, painted black.

At the bottom is placed a strip of milk glass, extending from end to end, held in place by small pieces of rubber (ends of a small rubber cork) fastened to each side by small screws. The edges of the rubber are put so close to the bottom board that the glass can be just forced in between, and when in place it is firmly held.

About two inches above this is a strip of clear glass resting on cleats at the sides of the rack, fixed in place in the same manner as above described, and upon this clear glass the Nessler tubes stand. The necessity for raising the tubes from the white background, in order to make a comparison is thus obviated, and the whole apparatus may be very readily cleaned and kept in

condition. The drawbacks in the use of white paper for a background which may be easily wetted or stained are removed.

It has been found convenient to use a rack of ten or twelve holes, since with that the standards can be placed in every other hole, leaving the vacant spaces for the tubes to be compared.

## NEW BOOKS.

LESSONS IN QUALITATIVE AND VOLUMETRIC CHEMICAL ANALYSIS FOR THE USE OF PHYSICIANS, PHARMACISTS, AND STUDENTS. BY DR. CHAS. O. CURTMAN; INCLUDING LESSONS IN QUALITATIVE CHEMICAL ANALYSIS, BY DR. F. BEILSTEIN. Fourth edition. St. Louis, Mo.: John L. Boland Book and Stationery Company. 1894. Price $1.50.

This new edition of a work intended primarily for students of medicine and pharmacy, contains chapters on manipulations of chemical apparatus, qualitative analysis (inorganic), examples for practice in the analysis of organic substances (proximate), volumetric analysis, examination of drinking water, and urine analysis. The author says the section on volumetric analysis "contains numerous examples illustrating every important volumetric method and forms a complete commentary on the volumetric assays of the new U. S. Pharmacopeia." The book contains a number of cuts illustrating various forms of apparatus, urinary sediments, several pathologic micro-organisms, and two charts of spectra. Meyer and Seubert's atomic weights are used. "The orthography has been adapted to the rules of the Chemical Section of the A. A. A. S."

To cover so large a part of the domain of analytical chemistry within a space of 300 octavo pages has required the constant and severe abridgment of methods allowing no opportunity for a discussion of their merits. The author has accomplished his purpose with more than ordinary success. As a rule he has shown excellent discrimination in the choice of methods, and has in some cases introduced matter one would hardly expect to find in so small a work, *e. g.*, Gutzeit's, Fleitmann's, and Bettendorf's tests for arsenic. Physicians and pharmacists will doubtless find the work a useful one. In some cases brevity of treatment has led to dogmatic statements that are liable to be wrongly interpreted by those having little knowledge of the subject under