It will be noticed that the first table gave uniformly low results. This was attributed to the loss of silver in scorification and cupellation, and in order to correct this loss four assays were run containing 0.06512 gram pure silver each, corresponding to 0.024725 gram arsenic trisulphide (the amount found by titration in numbers 1, 2, 4, and 5 in Table 2). The average loss was found to be 0.001 gram silver, which, added to the amounts in Table 1, gave an average result agreeing very closely with those of the above numbers in Table 2.

Following is Table 1 corrected for loss of silver in scorification and cupellation:

TABLE 3.

No. of determination.	Silver found as per Table 1. Gram.	Silver after correction. Gram.	Calculated amount of arsenic trisulphide. Gram.
1	0.063915	0.064915	0.024648
2	0.06324	0.06424	0.024392
3	0.06472	0.06572	0.024954
4	0.06345	0.06445	0.024472
5	0.065075	0.066075	0.025089
6	0.063675	0.064675	0.024457

Average amount of arsenic trisulphide 0.024670

One gram of leucopyrite was fused and made up to 500 cc. Portions of fifty cc. were treated as above and titrated with potassium thiocyanate (1 cc. = 0.0017536 gram arsenic). Results were as follows:

TABLE 4.

No. of determination.	Standard solution of potassium thiocyanate. cc.	Arsenic found. Gram.	Arsenic in ore. Per cent.
1	7.0	0.012275	12.275
2	7.0	0.012275	12.275
3	7.0	0.012275	12.275
4	7.0	0.012275	12.275

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A SIMPLE VOLUMENOMETER.

BY C. E. LINEBARGER.

Received February 14, 1899.

MCKENNA[1] has recently described a "New Apparatus for the Determination of Volume," which resembles in several respects one which I have devised and have been using

[1] This Journal, 21, 50 (1899).

for some time past. While in accuracy and ease of manipulation my apparatus possibly does not surpass McKenna's, it has the advantage of being readily constructed out of pieces of apparatus found in almost any laboratory, and also allows a very easy recovery of the solid whose volume has been determined.

A wide-mouthed bottle (two-ounce) is fitted with a twice-perforated rubber stopper or cork, if the liquid used attacks rubber. Through one of the holes is passed a ten cc. pipette, graduated in tenths of a cc. and permitting of the estimation of $\frac{1}{100}$ cc. Through the other hole passes a funnel tube with a short stem bearing a mark just below the widened part. The stem-end must be flush with the lower surface of the stopper so that the bottle may be completely filled with liquid without imprisoning any air-bubbles. A long piece of rubber tubing is attached to the upper end of the stem and provided with a good pinch-cock of any sort.

To use the apparatus, it is filled with liquid to a little above the stopper, great care being taken to remove all air bubbles. Suction is then applied to the extremity of the rubber tube so as to bring the level of the liquid in the funnel stem to the mark, when the cock is closed. The position of the liquid in the pipette is then noted, the hundredths of cubic centimeters being estimated. A weighed amount of the solid whose volume is to be determined is then placed in the funnel, and the liquid blown up and down gently until the solid is all washed into the bottle. The liquid is then brought to the mark on the funnel stem and the new position of the meniscus in the pipette read off. It is of course advisable to make several adjustments and readings of the levels and take their average.

To eliminate inaccuracy from change of the temperature of the liquid, the bottle may be packed in a box with some non-conducting material, as cotton-wool, etc. This seems to be a needless refinement, however, for the temperature of a laboratory changes but little during the time required for a determination, and it is not necessary to handle the bottle, so that it does not receive heat in that way. Moreover, the error is small compared with the error due to air adhering to the particles of the solid.

To show what results may be obtained with the apparatus,

full data are given for a series of determinations made with Ceylon graphite using kerosene as the liquid. The graphite was mostly in the form of a very fine powder, although many pieces as large as a grain of wheat were present. The kerosene had been dried by standing for three years over sodium shavings. The temperature of the liquid (about 20°) did not change by 0.5° during the experiments. Ten grams of the graphite were added each time.

READINGS ON PIPETTE.

Before solid was added. cc.	After solid was added.	After ten grams more solid was added.
9.92	5.67	1.42
9.90	5.67	1.44
9.91	5.64	1.43
9.91	5.66	1.43

Volume of ten grams of graphite..... $\begin{cases} 9.91-5.66=4.25 \\ 5.66-1.43=4.23 \end{cases}$

Density of graphite ..... $\begin{cases} \frac{10.00}{4.15}=2.35 \\ \frac{10.00}{4.23}=2.36 \end{cases}$

The apparatus was taken apart, cleaned, dried and reassembled, and two more determinations made. The volumes found were 4.22 and 4.26, respectively, and the corresponding densities 2.37 and 2.34.

Of course, other dimensions than those given above for the apparatus may be taken. Also, if it is desirable to know the temperature exactly, a thermometer may be introduced directly into the liquid by using a three-hole stopper.

THE SOLUBILITY, IN WATER, OF CERTAIN NATURAL SILICATES.

BY GEORGE STEIGER.

Received February 11, 1899.

IN this Journal for October, 1898, there is a preliminary paper upon this subject by Professor F. W. Clarke. The results shown in that paper were of such a character, that it was thought worth while to carry the investigation further, and an attempt has been made to show in what degree the different minerals are attacked by water after long standing.