paraffines, sesqui- and polyterpenes. After these preliminary tests the analysis proper is undertaken, using first a small portion of the oil and then if the method employed has proved successful, the bulk of the oil, never trusting the entire stock of the oil to an untried or doubtful method of procedure. As cold does not decompose the oils, they are subjected to a chilling process, often separating crystals of menthol, borneol, etc. This can be followed by treatment with sodium bisulphite, thus separating the aldehydic and ketonic bodies, which would be destroyed by the subsequent treatment. In this process it should be borne in mind that in some cases the bisulphite compounds form very slowly, requiring several days, as in the case of thujone. Another difficulty is due to the fact that some aldehydes, like citral, unite with a second molecule of sodium bisulphite yielding liquid compounds. The aldehydic substances being removed, the acids and phenols are separated by treatment with caustic potash or soda solution, too strong solutions not being used as these dissolve hydrocarbons. Fractional distillation of the residue now follows, preferably at a reduced pressure of 15 mm.; various distilling flasks and receivers employed for this purpose are shown. The article closes with a table giving the more frequently occurring constituents of the essential oils arranged in the order of their boiling-points.

The Estimation of Bisulphide of Carbon. By A. Goldberg. *Am. Gas Light J.*, 72, 531.—The method depends upon the following reactions:

$$CS_2 + 2NH_3 = CS{<}^{SNH_4}_{NH_2}$$

$$CS{<}^{SNH_4}_{NH_2} + ZnO = ZnS + H_2O + NH_4CNS.$$

The substance under examination is heated on a water-bath in a strong, tightly-closed flask with 5 cc. ammonia (sp. gr. 0.91) and 25 cc. absolute alcohol, to a temperature of 60°, although 100° does no harm. When the reaction is finished, the solution which should be of a yellow color, is considerably diluted, a known volume of a standard ammoniacal solution of zinc is added, and the solution is heated to boiling with continuous stirring. The excess of zinc is determined by a standard solution of sodium sulphide using sodium nitroprusside as an indicator. The results of four analyses agreed well.

APPARATUS.

A. H. Gill, Reviewer.

Description of a New Respiration Calorimeter. By W. O. Atwater and E. B. Rosa. *U. S. Dept. Agr. Bull.*, 63; *Phys.*

Rev., 9, 129–163.—"The essential features of the apparatus are: 1. A chamber in which the subject of the experiment, a man, lives, eats, drinks, sleeps, and works during a period of several days and nights. 2. Arrangements for ventilation by a current of air which is drawn in from out of doors and passes through the chamber. The volume of this current is measured and the percentage of moisture in it and carbon dioxide contained in it determined before and after leaving the chamber; the temperature of the air is the same when leaving as upon entering. 3. Arrangements for passing food and drink into the chamber and removing the solid and liquid excreta. 4. Arrangements for measuring the heat given off from the body of the man in the chamber and the heat equivalent of the external muscular work." The inner chamber is provided with double walls; the innermost wall is of polished copper and measures $7 \times 6\frac{1}{3} \times 4$ feet inside; outside of this and separated from it by an air space of 3 inches is a zinc wall. This is surrounded with three concentric walls of wood 2 inches apart. In the spaces between these latter walls air is made to circulate by fans. To measure the temperature of the zinc and copper walls, 304 thermoelectric junctions of German silver-iron are employed. It being so arranged that no heat can escape or enter through the walls of the calorimeter, the heat generated is measured and carried away by a stream of water flowing through a copper "absorber."

A Simplified Reductor. By P. W. Shimer. *J. Am. Chem. Soc.*, 21, 723–4.—The differences from the usual form consist in the use of a small quantity of amalgamated zinc, 80 grams, supported upon a sand filter in a narrow tube. The hot lower part of the reductor is particularly effective in the reduction.

Apparatus for the Analysis of Illuminating and Fuel Gases. By G. E. Thomas. *J. Am. Chem. Soc.*, 21, 1108–1112.—The apparatus is essentially a modification of the well-known Orsat apparatus, and cannot be described without the figure. No results of work with the apparatus are given, although they are stated to be "eminently satisfactory." In view of the fact that the explosion is made over water and that the "illuminants" are absorbed with bromine, it is difficult to understand how this can be the case. Nor would this description seem to apply to the apparatus itself; for since it contains eight glass stopcocks, it must be expensive to make and maintain; and from the shape of the absorption bottles it must be fragile and cumbersome.

Note on a Method of Standardizing Weights. By T. W. Richards. *J. Am. Chem. Soc.*, 22, 144–149.—The weights are compared by substitution, the comparison beginning with centi-

grams and proceeding upwards; the weights, being the objects to be weighed, are placed on the left hand pan. Every weight is compared with every other weight of the same size and with the sum of the smaller weights; the centigram weight is assumed to be correct and from it the values of all the other weights can be determined. The data and results of standardizing a set of weights are given as an illustration.

Laboratory Method for the Continuous and Uniform Generation of Acetylene for its Purification. By J. A. Mathews. *J. Am. Chem. Soc.*, **22**, 106–108.—The fragments of calcium carbide are suspended in a basket of coarse wire netting in a wide-mouthed bottle; the bottle is closed with a doubly perforated stopper carrying a dropping tube and gas delivery tube; and the carbide is covered with 95 per cent. alcohol. The water in the alcohol starts the generation of gas which is continued by the addition of more water, the temperature being kept low by the alcohol. When the carbide is used up, the alcohol may be distilled off giving nearly absolute alcohol, especially if the first few cubic centimeters coming over be rejected. The gas is purified by passing through acid copper sulphate solution and chromic acid.

A Simplification of Beckmann's Boiling-point Apparatus. By S. L. Bigelow. *Am. Chem. J.*, **22**, 280-7.—The various asbestos stoves, mantels, lamps, etc., are replaced by a heating coil of platinum wire 20 cm. long, and 0.1 mm. in diameter. A current of two amperes gives ample heating effect for all ordinary solvents. The coil is connected up by sealing the ends through a tube afterwards filled with mercury, into which the lead wires dip. A felt mantle or preferably a Dewar's vacuum-jacketed vessel complete the apparatus. The results obtained with it by students were very satisfactory.

A Method for the Determination of the Melting-point. By M. Kuhara and M. Chikashigé. *Am. Chem. J.*, **23**, 230–233.—The modification consists in replacing the familiar capillary tube by a pair of halved microscope cover glasses held together by pieces of platinum foil and wire. This permits the heat of the bath to be conducted throughout the whole mass and enables a sharp melting-point to be taken, it being shown by the glass becoming transparent. The results obtained agree well with the usually accepted melting-points.

Absorption Apparatus for Elementary Organic Analysis. By Francis G. Benedict. *Am. Chem. J.*, **23**, 323–334.—A U-tube containing a graduated vial for the condensation and collection of water, sealed in the bend with strong sulphuric acid,

and having one arm filled with glass wool saturated with acid, is used for the absorption of water. Carbon dioxide is absorbed in slightly moistened soda-lime, two U-tubes being used, the last one being partly filled with pumice stone saturated with sulphuric acid. The increase in the second tube is usually 7 milligrams; if it be more, the first tube should be renewed. For drying the air or oxygen a 12-inch chloride of calcium jar containing pumice drenched with sulphuric acid is used; this has a tubulus sufficiently removed from the base that the cavity may contain about 20 cc. of acid.

An Apparatus for Determining Molecular Weights by the Boiling-point Method. By HERBERT N. MCCOY. *Am. Chem. J.*, **23**, 353–360.—The apparatus used is a modification of Landsberger's, the change consisting in boiling a part of the solvent in a jacket outside the tube in which the substance, the molecular weight of which is to be determined, is contained. This vapor is conducted through the solution in the inner tube. By this method an equilibrium is easily maintained between vapor and solution, and condensation is avoided, so that six determinations of the boiling-point may be made with the same amount of substance where only two were formerly possible. The results agree well with those obtained by Beckmann.

A Distilling Column for Illustrating the Principle of Fractional Distillation and of Dephlegmators. By OSWALD SCHREINERS. *Pharm. Rev.*, **18**, 8.—The apparatus consists of a Coffey's distilling column of twelve sections arranged for drawing off the various fractions and determining their boiling-points. Results are given showing the concentration obtained.

A Method for Carrying out Chemical Reactions under High Pressures. By B. H. HITE. *Am. Chem. J.*, **22**, 80–86.—A platinum or collapsible lead or tin paint tube closed with a screw cap is placed in a lead tube 6 inches long and $1\frac{1}{4}$ inches in diameter, is filled with water, closed with a lid, and placed in a steel cylinder (6 x 7 inches) with a hole through it $1\frac{1}{4}$ inches in diameter. The lead tube rests upon a plug closing the lower end of the steel cylinder, while the upper end is closed by a piston; upon this the pressure is exerted by means of a hydraulic press, pressures up to 100 tons per square inch being employed. The effect of the arrangement is to enclose the liquids to be tested in one continuous piece of metal. Arrangements are made by means of a cylinder fitted with a screw, whereby this pressure can be maintained for a considerable length of time.

A Modified Soxhlet Apparatus for the Extraction of Fat from Liquids. By A. E. TAYLOR. *Am. J. Physiol.*, 3, 183–5.—The

modifications consist in raising the junction of the siphon tube with the body of the extractor so as to leave about 110 cc. of liquid in the latter. The solvent passes to the bottom of the extractor through a tube ending in a rose connected with the condenser, and thence up through the liquid. No cork connections are used. The apparatus is easily made and cleaned.

H. M. GOODWIN, REVIEWER.

Three Additions to the Kohlrausch-Ostwald Conductivity Method. BY J. LIVINGSTON R. MORGAN. *J. Am. Chem. Soc.*, **22**, 1–5.—The first addition consists of the substitution of a special magnetic vibrator operated at a distance for the usual vibrating spring contact in the primary circuit of the induction coil; the second, the familiar use of extension coils at the end of the slide wire bridge; and the third, the use of two contact points on the slide wire to assist in locating the position of points where the sound heard in the telephone is of equal intensity.

A New Interrupter for the Kohlrausch-Ostwald Conductivity Method. BY J. LIVINGSTON R. MORGAN. *J. Am. Chem. Soc.*, **22**, 26–28.—A slight modification of the interrupter referred to above. The wire carrying the primary current of the induction coil vibrates between the poles of an electromagnet, the contact being made and broken through a mercury cup.