

mixture of sodium sulfide and lime; this loosens the wool after a few hours, depending upon the temperature. Then the wool is easily pulled off and, after classification, it is dried mechanically and packed for export. The pelts, after the removal of the wool, are washed and limed, then scudded and fleshed; after deliming in fermented bran infusion or in dilute lactic and acetic acids, they are pickled in a concentrated salt solution to which sulfuric acid has been added. Trouble has arisen in connection with the cured pelts, through the development of purple stains, and while doubtless some of these were due to iron, yet in the majority of cases the cause has been definitely traced to certain microorganisms capable of growing on pelts containing 8 to 9 per cent of salt and 0.3 per cent free sulfuric acid; experiment has demonstrated that properly cured pelts containing 12 to 13 per cent of salt and 0.5 to 0.6 per cent of free acid will withstand damage from the microorganisms, *B. prodigiosus*, which do cause purple stain in pelts not sufficiently cured.

#### PRESERVED MEATS

The tongues of the slaughtered animals form the chief material useful in canning, although to meet demands, considerable quantities of mutton and beef are also canned. The methods of preparation and canning follow on the whole American practice. In the curing of the meats it was found that a pure salt of 99.9 per cent purity was removing more of the soluble protein and meat bases than a salt of 97 per cent purity containing small amounts of magnesium and calcium salts, leaving the cured meats somewhat flavorless; it was found necessary to discontinue the use of the former salt on account of its purity; the influence of the impurities present in some curing salts upon the soluble matter of meat is at present the subject of investigation. The Pure Food regulations of New Zealand prohibit the use of more than 0.2 per cent of saltpeter in preserved meats.

#### MEAT EXTRACT

In the manufacture of this product, the material chiefly used in New Zealand is mutton; hearts and diaphragms are principally used, the material being coarsely minced and extracted in hot water, the resulting liquor, after filtration, being concentrated by open pan evaporation. It has been demonstrated that prolonged heating, such as that given in the open pan evaporation, is productive of the formation of certain bitter substances which give a "burned" flavor to the extract. These are probably peptone-like substances of which, up to 12 per cent, may be present in an extract "burned" flavor. In the preparation of an extract by rapid vacuum evaporation from a similar liquor there is found but 0.3 per cent of peptone-like substance and the "burned" flavor is absent.

#### CHEMICAL CONTROL

Tankage is examined for moisture, nitrogen, fat and tricalcic phosphate; blood for moisture, and nitrogen, moisture above 10 per cent being considered excessive and fat above 15 per cent indicative of faulty rendering; the amount of bone present in the

tankage determines largely the relative proportions of nitrogen and tricalcic phosphate. Mixed fertilizers are examined to ensure that they are up to the registered minimum guarantee.

Tallows are examined for titer, acidity, moisture, and ether-insoluble matter. Determinations of moisture, fat, and dirt are made on the wool samples. In oleomargarine the moisture, acidity, and foreign matter are determined as well as a note made of the "seeding," the odor, and the taste.

Meat extract is examined for moisture, salt, total nitrogen, acidity, fat, insoluble and coagulable proteids, proteoses, peptones, meat bases, and ammoniacal nitrogen. In order to ensure compliance with the pure food regulations, the amounts of potassium nitrate in preserved meats are controlled from the laboratory by frequent examinations. Pelts are examined for salt and free acid.

The water used in the preparation of the various foods is examined bacteriologically as well as chemically; the wrappers used for covering the frozen meats are examined for weighting matters, and soluble organic matter (chiefly starch) as well as being subject to test as a medium for the growth of microorganisms. The various stores used in connection with the manufacture and preparation of the products are purchased subject to control in the laboratory.

During the "off" season research work dealing with the problems met with in this industry is carried out.

CHEMICAL LABORATORY  
THE CHRISTCHURCH MEAT CO., LTD.  
CHRISTCHURCH, N. Z.

### THE DETERMINATION OF THE MELTING POINT OF GREASES BY MEANS OF THE NEW YORK TESTING LABORATORY VISCOSIMETER

By HERMANN W. MAHR

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The determination of the melting point of greases used for lubrication is the most important physical test made on these materials. The melting point of a grease plays the same part in judging its suitability as the viscosity does in the case of a lubricating oil.

Many methods for making this determination involving the use of a capillary tube have been devised. These methods require the grease to be melted into the tube and the tube and its contents then allowed to stand several hours, preferably over night, in order that the grease may regain its normal melting point. The exact melting point is somewhat difficult to fix by this method.

Pohl has devised the drop point method in which a thermometer bulb is covered with the grease and immersed in a water bath. We have made determinations by this method but find it hard to obtain checks, since it is difficult to decide when the grease is melted and to regulate the amount of grease on the bulb of the thermometer. Ubbelohde has modified the Pohl method and made it more exact by using a specially designed apparatus.

Gillet<sup>1</sup> has proposed a method which is more adapted

<sup>1</sup> THIS JOURNAL, 1, 352 (1909).

for the technical examination of greases. This method consists of closing the end of a glass tube of specified size of bore and length with a plug of grease 1 cm. long. This tube is then fastened to a thermometer so the plug is beside the bulb, and immersed in water with the bottom of the plug 5 cm. below the surface. The water is then heated at a given rate and the point at which the plug slides up under the water pressure is taken as the melting point. Gillett mentioned and experimented on the effect of four variable conditions which influence the results of the determination. These are the diameter of the tube, the length of the plug, the depth of its immersion, and the rate of heating. We have also noticed that, owing to the length of the tube, it is sometimes difficult to decide at just what point the plug was pushed upward; this is especially noticeable with greases of low melting points and thin consistency.

The use of the New York Testing Laboratory viscosimeter in determining the melting point of greases according to the Gillett method overcomes some of the difficulties arising through the use of the glass tube and offers other advantages. This instrument was devised by Mr. C. N. Forrest,<sup>1</sup> of the New York Testing Laboratory, for determining the consistency of bituminous materials. The apparatus is in two parts, a float and a conical brass collar. The

float is a deep aluminum saucer with a threaded opening in the center. The brass collar screws into the opening in the float.

The method of determining the melting point of a grease is as follows:

The brass collar is filled with the grease and screwed into the saucer. The apparatus is then floated upon the surface of the water contained in a large beaker which is provided with a thermometer whose bulb is as close as possible to the float and at the same level as the middle of the collar. The beaker should also be provided with some form of stirrer. The water in the beaker is now heated at the rate of 3-4° Centigrade

per minute. When the grease is sufficiently soft the plug in the collar will be forced out by the pressure of the water and the apparatus will sink. The temperature at which the float disappears below the surface of the water is taken as the melting point of the grease.

The melting points of several samples of grease were taken, using this apparatus, and it was possible to check these determinations to within 1° Centigrade. The melting points of these samples were also determined by the Gillett method. The results are tabulated below:

New York Testing Laboratory  
Viscosimeter method

Sample	Determination		Gillett method
	No. 1	No. 2	
3645A.....	96° C.	95° C.	96° C.
3645B.....	95° C.	96° C.	97° C.
3645C.....	96° C.	97° C.	98° C.

The use of the New York Testing Laboratory viscosimeter for determining the melting points of greases offers a rapid accurate method. By employing it the size of the plug, the depth of its immersion, and the diameter of the tube become constants, while they are liable to vary when a glass tube is used. In addition, the melting point is indicated sharply by the apparatus sinking. The determination of the melting points of soft, low melting greases offers no difficulties by this method, since it is easy to obtain the proper sized plug and to determine the point at which it melts. When the grease melts in this apparatus it slides along on a metal surface instead of glass, thus approaching more closely conditions in grease cups and on bearings.

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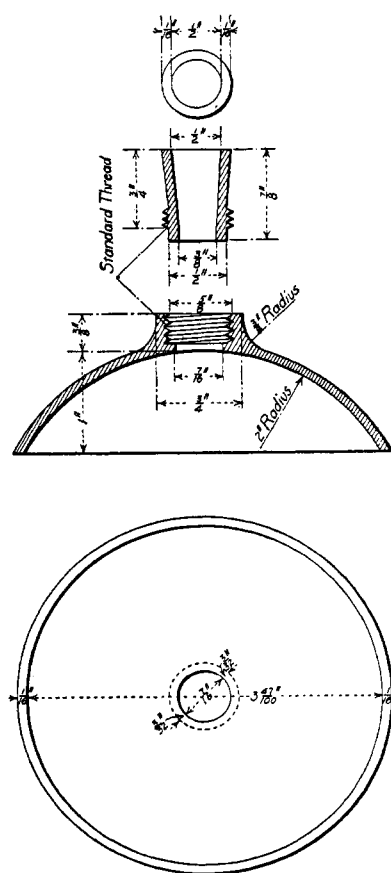
#### CONVENIENT DEVICE FOR ANALYTICAL IGNITIONS

By EDWARD D. CAMPBELL

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Where students in beginning quantitative analysis do not have the use of platinum crucibles, the gravimetric determination of calcium oxide frequently presents difficulties. The precipitate of calcium oxalate may be ignited at a low heat and weighed as calcium carbonate, but in such cases the results are apt to be too low on account of partial decomposition of calcium carbonate. When an inexperienced worker depends upon complete decomposition to calcium oxide in a porcelain crucible the results are usually too high because decomposition has not been complete, or, if a blast lamp has been used, the temperature of the bottom of the crucible may become so high that the calcium oxide will attack the glaze of the crucible.

It was in order to overcome these difficulties that the combined support and protection herein described was devised for the triangle holding the crucible. These protected triangles have been in use in this laboratory for more than a year and have proven so satisfactory that it was thought a description of the method of making them would be of interest to other chemists. The use of these protected triangles has



NEW YORK TESTING LABORATORY VISCOSIMETER<sup>2</sup>

per minute. When the grease has become suffi-

<sup>1</sup> *Engineering Record*, 59, 584.

<sup>2</sup> Cut used with the permission of Mr. C. N. Forrest.