washed somewhat and the ashing completed by returning the filter paper to the original dish. Excessive heating should be avoided. Removal of most of the alkali present before completion of the ashing aids in preventing over-heating of the greater portion of the sample."

Conclusions and Recommendations

On the basis of the collaborative results on the three methods studied, the Lindo-Gladding Method gave the most concordant results. Consequently the Committee recommends the adoption of this modification of the Lindo-Gladding Method as a tentative method of the Society.

The Committee recommends that the method for the Determination of Volatile Hydrocarbons tentatively adopted October, 1935, be made official.

The 1937 membership of this committee is as follows:

Messrs: H. C. Bennett
J. M. Burmaster
H. E. Cutts
J. E. Doherty
L. B. Hitchcock
L. F. Hoyt
C. P. Long
E. R. Luckow
R. C. Newton
B. S. Van Zile
F. W. Smither
H. F. Trevithick
R. B. Trusler
M. L. Sheely, Chairman

REPORT OF THE UNIFORM METHODS AND PLANNING COMMITTEE--FALL MEETING--OCTOBER 14-15, 1937

THE Uniform Methods and Planning Committee received no methods for consideration except those of the Soap Section. The full reports of the Committees of this section will appear in OIL & SOAP. The recommendations of these committees follow:

Sections 16 *and* 17 *Screen Test:*

It is recommended that:

1. The Ro-Tap Method be changed to read 100 gms. (± 0.1 gm.) instead of 8 ounces.
2. A slight modification of the hand test is recommended to define "negligible" quantity passing through the bottom sieve. The committee defines this as "less than 0.1 gm. per minute of shaking."
3. Change present methods, both hand screen and Ro-Tap, to read: "clean and dry" instead of "dry."
4. Insert the following note after *procedure* in both methods: "Note —At least duplicate determinations shall be made and averages taken."

Determination of Combined Sodium and Potassium Oxides in Soaps

On the basis of the collaborative results obtained by the three methods studied, the Lindo-Gladding method gave the most concordant results. Consequently the Committee recommends the adoption of this modification of the Lindo-Gladding Method as a tentative method of the Society.

Section 15. *Volatile Hydrocarbons (Tentative)*

The Committee recommends that the method for the determination of volatile hydrocarbons, which was tentatively adopted in October 1935, be made official.

Committee on Soap Wrapper Paper (1937)

The affirmative votes involving the use of a soap contact method for testing soap wrapper paper, appear to warrant that this method as published in OIL & SOAP, in the 1936 Report of the Soap Wrapper Committee, be recommended as a tentative standard of the A.O.C.S.

The Uniform Methods Committee concur in all of these recommendations and move their adoption. The motion was seconded and the changes were adopted unanimously.

E. B. Freyer
C. P. Long
R. C. Hatter
J. T. R. Andrews
H. P. Trevithick
J. J. Vollertsen, Chairman

ABSTRACTS

Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

The extraction process—the unique oil production methods of the future. M. Singer. *Seifensieder-Ztg.* **64**, 863-5, 881-2 (1937). The extn. of oil is discussed. The advantages of solvent extn. in that greater yields and better qual. oil are obtained is stressed. Differences in cost of pressing and extn. are briefly given.

Wool fat and wool fat alcohols, valuable materials for the manufacture of cosmetics. W. Gansale. *Fette u. Seifen* **44**, 460-2 (1937). Review.

Relation between iodine value and refractive index of some hardened oils. Y. Maruta and K. Teruyama. *J. Soc. Chem. Ind. Japan* **40**, Suppl. binding 299 (1937). Equations are given. (*Chem. Abs.*)

Hydrogenation of oils with a multicomponent catalyst under high pressure. S. Ueno. Z. Okamura and S. Ueda. *J. Soc. Chem. Ind. Japan* **40**, Suppl. binding 292-4 (1937). Expts. showed: speed of hydrogenation increases as temp., pressure and amt. of catalyst are raised; at about 200° the reaction rate increases abruptly; the multicomponent catalyst is more powerful than a reduced Ni catalyst and when mixed with reduced Ni makes a very effective catalyst. (*Chem. Abs.*)

A note on the preferential reduction of certain fatty acid groups during hydrogenation of natural fats. D. A. Harper. *J. Soc. Chem. Ind.* **56**, 308-10T

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(1937). The rate of hydrogenation for fat acids were evaluated by taking the rate for octadecenoic to stearic as unity. Data for several acids and oils are tabulated. Octadecenoic to stearic reduction in glycerides seems to be the slowest, hexadecenoic to eicosenoic faster and docosenoic the most rapid. The extent of these preferences is somewhat smaller than that of diethenoid and monoethenoid acids. The preference is completely reversed in the case of C_{22} and C_{18} series, the C_{18} acid being in this case preferentially reduced to the C_{22} acid. The reduction of mixed esters is definitely more preferential than in the neutral glycerides of cottonseed oil. Increase in temps. causes a greater degree of selection in the case of linoleic and oleic derivs. Selective effect vanishes at low I value. The various conclusions drawn from the results of many workers on a no. of different oils indicate some of the many preferential hydrogenation effects which may be involved during catalytic hydrogenation of a natural fat.

Antioxidant action of tin salts toward olein and oils. S. H. Bertram. *Internat. Tin Res. Development Council Tech. Publ. Ser. A, No.* **45,** 3-10 (1936). By means of the Mackey test it was shown that tin salts increase the induction period and reduce the oxygen uptake of olein. 0.1% tin in form of oleate, stearate or benzoate is especially active. It is nontoxic and adds no color to the oil. .01% is without effect. After the induction period in cottonseed oil the addn. of tin salts was without influence.

The effect of hydroxyl groups on the apparent diene values of vegetable oils and fats. W. Bickford, F. G. Dollear, K. S. Markley. *J. Am. Chem. Soc.* **59,** 2744-5 (1937). Castor oil exhibited the characteristic behavior of hydroxylated compounds, giving an appreciable M. A. V. and diene value which fell to nearly zero after acetylation. Tung oil also exhibited a small decrease in M. A. V. and diene value after acetylation. However, the M. A. V. and diene values of linseed and soybean oils, which were initially low, rose appreciably after acetylation. In the case of these 2 oils the increase in the diene value (800-1000%) was accompanied by an increase in the refractive index, a decrease in the I value, and a shortening of the drying time; all of which indicated a shift of the polyethenoid bonds toward a conjugated system.

The component acids and glycerides of partly hydrogenated marine animal oils. I. General review of the analytical procedure employed. D. A. Harper, T. P. Hilditch and J. T. Terleski. *J. Soc. Chem. Ind.* **56,** 310-15T (1937). Details for removal of unsapon. matter, ester fractionation, detn. of satd. esters present in certain ester fractions and methods of calculation involved are presented. II. Antarctic whale oil. Ibid. 315-22T. The oil (sap. eq. 286-5, I no. 109.3, and free acid 0.53%) contained mixed fatty acids in the following molar % compn. Myristic 9, myristoleic 4, palmitic 17, palmitoleic 17, stearic 2, C_{18} unsatd. (mean unsatn. —2.6H) 35; C_{20} unsatd. (—5.6H) 12 and C_{22} unsatd. (—9H) 4.

Some further observations on the component glycerides of olive and tea-seed oils. T. P. Hilditch and H. M. Thompson. *J. Soc. Chem. Ind.* **56,** 434-8T (1937). The cause of the discrepancy observed in earlier work on the tri-C_{18} glyceride content of olive and teaseed oils (detd. as tristearin in the completely-hydrogenated fats) has been investigated. It appears that the method employed gives low results with mixtures of satd. triglycerides contg. between about 50 and 70% of tristearin, and cannot be regarded as trustworthy over this range; for mixtures contg. below 40% or above 75% of tristearin the procedure has been found to give satisfactory results. The detn. of tri-C_{18} glyceride content by examination of the mixed saturated-unsatd. glycerides of an oil partly hydrogenated to a suitable stage or stages gives results consistent with the limits set by the fatty acid composition. Distillation of the unsatd. esters from olive and tea-seed oils through an electrically-heated fractionation column, and also study of appropriate fractions of the unsatd. esters by means of oxidation or hydrogenation, has shown that hexadecenoic acid is present in small proportions (not more than 1% of the total fatty acids of the oils).

The component fatty acids of the phosphatides of soya bean and rape seeds. T. P. Hilditch and W. H. Pedelty. *Biochem. J.* **31,** 1964-72 (1937). All the characteristic fatty acids of the glycerides are also found in the phosphatides. The proportion of satd. acids is, in both instances, higher in the phosphatide than in the glyceride acids. In this respect seed phosphatides seem to resemble those of animal liver fats, but it is to be noted that in the seed phosphatides the increase is wholly in palmitic acid, whereas in the animal liver fats studied the stearic acid content increased in the phosphatides, the palmitic acid percentage being much the same as in the liver glyceride acids. This is not unnatural, however, for palmitic is the characteristic satd. acid occurring in practically every fat in the vegetable kingdom, whereas stearic acid is but rarely found as a major component acid of vegetable lipoids. Hexadecenoic acid is present in some quantity in the seed phosphatides but it is present only in very small amts. in seed glycerides. The results further show that comparisons which have been made from time to time on the basis of the I no. alone of mixed fatty acids of phosphatides and glycerides are of little value without some form of detailed analysis—at the least, a detn. of the proportions of satd. acids present.

Oat flour and hexane extract of oat flour as antioxidant for shelled walnuts and walnut oil. C. L. Bedford and M. A. Joslyn. *Food Research* **2,** 455-69 (1937). Oat flour and oat flour ext. were found to appreciably reduce the oxidation of walnut meats and oils. The flour was more active than the hexane ext. In order of decreased protection of walnut oil against

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oxidation the antioxidants used were as follows: .1% triethylamine, 5% Avenex, .1% hydroquinone, .1% maleic acid and .1% alphanaphthol. They behaved somewhat similarly towards cottonseed and walnut oil. Fluctuations and jumps were noted in peroxide values which may have been due to choice of original sample and sampling. The I no. of walnut oil decreased but slightly with increase in peroxide value, this decrease being somewhat more in presence of Avenex.

Vitaminizing of margarine. *Am. J. Public Health* **27,** 1226. The Danish Ministry of the Interior appointed a commission for considering the addn. of vitamins to margarine. It concluded that there was no doubt that the vitaminizing of all margarine with A and D vitamins will be of great importance in Denmark as many of the people will only in this manner be able to satisfy their natural vitamin requirements without exceeding their means. It was recommended that all margarine should contain 14 to 18 international A vitamin units and 0.1 to 1.0 international D vitamin units per gram. The commission recommended that the A vitamin effect of margarine should be secured by its contg. the A vitamin itself and carotin, and in the same proportions as butter, i. e., half of the effect being from A vitamins and about half from carotin.

Vitamin fortification of margarine. A. Scheunert. *Ernahrung* **2,** 49-55 (1937). Results of feeding tests with rats, presented in the form of growth curves, indicate that vitamin A-deficient margarines were satisfactorily fortified by the addn. of 2 and 5% resp., of a Scandinavian (I) and an English (II) concentrate.

II was somewhat more potent since good growth was obtained when the margarine contg. it was fed at a level of 0.1 g. per rat per day, whereas a less pronounced growth response was obtained with a daily supplement of 0.3 g. of the margarine fortified with I. S. indicates that the concentrates were undoubtedly prepd. from fish-liver oils but so treated that no objectionable flavor was imparted to the margarines. Fortified margarines imported from Holland and Sweden were tested and found to contain vitamin A in sufficient amts. to give satisfactory growth response when fed at 0.2 g. supplements. (*Chem. Abs.*)

Emulsification agents for mayonnaise. N. I. Kozin, N. N. Edelshtein and M. B. Lure. *Masloboino Zhirovoe Delo* **13,** No. 3, 28-30 (1937). The results of preliminary tests showed that alk. casein soln., obtained by treating casein with 5 vols. of 1% $NaHCO_3$ at 100°, when used as an accessory emulsifying agent increases the stability of mayonnaise. The optimum conditions are on addn. of 1% casein with preliminary emulsification of oil with casein before the addn. of vinegar. A gradual addn. of H_2O (100 cc. to 1 L. oil) prevents the formation of excessively heavy consistency and lumps in mayonnaise. The stability of well-prepd. products rises gradually to a max. in 15-30 days. The addn. of sour cream toward the end of churning with subsequent centrifuging for 1-1.5 hrs. greatly improved the stability, taste and appearance of the mayonnaise. Potato starch proved to be a poor emulsifying agent. When used as a filler, dry or in 5% soln., the oil content can be reduced by 35-40% without affecting the mayonnaise stability. All tests were made with egg yolk powder as a chief emulsifying agent. (*Chem. Abs.*)

The hydrolysis of glycerides by crude pancreas lipase. A. K. Balls, M. B. Matlack and I. W. Tucker. *J. Biol. Chem.* **122,** 125-137 (1937). The hydrolysis of tristearin with pancreatic lipase has been carried to practical completion. The course of the reaction is smooth throughout. The hydrolysis of monostearin is approximately monomolecular and goes faster than that of tristearin. The fat remaining after partial hydrolysis of tristearin has been isolated and found to consist almost entirely of tristearin, so the gross chemical composition of the substrate remains practically unchanged throughout the digestion. The hydrolysis of the higher, but not of the lower, satd. triglycerides is very dependent on temp. The difference is so marked that if the behavior at low temps. only were known, pancreas lipase would be regarded as specific for lower glycerides. At moderate temps., however, a max. rate of splitting is exhibited by the straight chain satd. glycerides of acids contg. approximately 7 to 10 C atoms. This does not apply to unsatd. glycerides, for olein behaves as though it contained a C_9 rather than a C_{18} acid.

The chemistry of vitamin E. Tocopherols from various sources. O. H. Emerson, G. A. Emerson, Ali Mohammad and H. M. Evans. *J. Biol. Chem.* **122,** 99-107 (1937). α-tocopherol has been isolated by means of the allophanate from cottonseed oil, lettuce leaves, and palm oil; and from each of these sources has, within the limits of accuracy of the test, the same vitamin E activity as that originally isolated from wheat germ oil. β-tocopherol from wheat germ oil was obtained as the allophanate crystallizing in well formed needles melting at 144-146°, and γ-tocopherol from cottonseed oil was obtained as the allophanate melting at 138-140°. These tocopherols appeared to be one-half to one-third as potent as α-tocopherol. α-tocopherol apparently identical with γ-tocopherol was obtained from palm oil, but the amt. was insufficient for its complete purification.

Metabolism studies with rats suffering from fat deficiency. G. O. Burr and A. J. Beber. *J. Nutr.* **14,** 553-66 (1937). Fat-deficient rats may synthesize much fat each day as indicated by high respiratory quotients. The fat synthesized from carbohydrate does not contain appreciable quantities of the essential fatty acids since these must be added to the diet to prevent decline and death. Although much smaller, the rats have a higher metabolic rate than their controls. Consequently, they have a much higher rate calculated as calories per sq. meter of surface. A normal diurnal activity is shown for all groups, which is independent

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of light and food. The minimum R. Q. is reached after 12 to 16 hrs. of starvation at 28.5° C. Minimum metabolic rate is reached in the afternoon after 20 hrs. of starvation.

Studies on the alleged toxic action of cod liver oil. E. Burack and H. M. Zimmerman. *J. Nutr.* **14,** 535-51 (1937). It is pointed out that in view of the small percentage of animals which yielded changes in the organs as a result of cod liver oil feeding at high levels, the claims that cod liver oil in therapeutic doses can exert injurious effects are not substantiated.

Drying oils. D. H. Killeffer. *Ind. & Eng. Chem.* **29,** 1365-6 (1937). Data on the production and imports of 5 important drying oils and their uses in the 3 important divisions of industry are presented. Lacquer, resin, etc., developments are briefly discussed.

Oxidation of unbodied linseed oil. C. C. Vernon and W. W. Rinne. *Ind. & Eng. Chem.* **29,** 1393-95 (1937). The 6 phenol-formaldehyde resins and mixtures of these resins with ester gum studied in this investigation showed marked antioxidant effect on pure alkali-refined linseed oil in the presence of driers. This effect was specific for each individual resin, and was confined to the induction period. This antioxidant effect was partially due, in 2 cases, to some oxidizable part or component of the resin, since it was markedly decreased when the resin was treated with oxidizing agents. This last fact was in accord with the theory of Moureu and Dufraisse relative to antioxygens, and indicated a possible treatment of such resins should their antioxygenic properties be undesirable. The resins studied were apparently free from simple phenols used in their manufacture, although one of the resin-ester gum mixtures yielded a considerable amt. of a complex phenol. The results of this investigation must not be compared to those attained with heat-bodied oils, since the oil used here was not heat-bodied. Neither must it be concluded that these resins prevented the complete drying of the oil, for the oil did dry eventually. The results of interest are those shown during the induction period of oxygen absorption.

PATENTS

Method of finishing shortening. T. M. Godfrey and V. Serbell (to Lever Bros. Co.). U. S. 2,101,496. The shortening fat is chilled to a semisolid and while heating it is aerated and pumped through a texturizing orifice.

Process for finishing fats. H. A. Keck (to Lever Bros. Co.) and S. 2,101,501. Same as 2,101,496 except that the orifice process is repeated.

Altered tung oil and process of making same. C. Ellis (to Ellis-Foster Co.). U. S. 2,101,791. The process of producing a varnish base which comprises heating a polyphenol with a tung oil material in the presence of an acid condensing agent at temp. sufficiently high to cause chemical reaction but not exceeding 150° C. until a sample cooled to room temp. is soft, rubbery, sticky solid and cooling the main portion of the reaction mass when this viscosity has been reached as indicated by the said cooled sample, and at a speed of cooling whereby gelation is prevented.

Polycarboxylic acid esters of polyunsaturated higher alcohols. J. H. Werntz (E. I. du Pont de Nemours & Co.), U. S. 2,101,227. An ester of a polycarboxylic acid wherein the hydrogen atom of at least one carboxyl group is replaced by the polyunsatd. hydrocarbon radical of an alc. contained by the reduction of fat acids from china-wood oil.

Hardening oils. Norwegian Patent No. 57,059, June 7, 1937. Dietrich Hildisch. The flesh of sea animals, e. g., whale blubber, is cut up and stored in a soln. of an acid, e. g., HCl, H_2SO_4, H_3PO_4 or HCOOH, of pH less than 5, particularly 1-3. When convenient the blubber is worked up and immediately afterward the hardening is carried out. To the acid may be added also benzoic acid and its derivs., HCHO and hexamethylenetetramine. (*Chem. Abs.*)

ABSTRACTS

Soaps

***Edited by* M. L. SHEELY**

Bleaching palm oil for soap making. *Soap Gazette and Perfumer* **39,** No. 10, 16 (1937). Good quality palm oil can be bleached for soap making purposes by treatment with an absorbent earth. The treatment is carried out in a steamheated vacuum pan and the oil agitated with about 5 per cent of the bleaching earth at a temperature of 120-140° C. for one to two hours after which it is cooled and passed through a filter press to remove the used earth. The earth is extracted with a suitable solvent in order to recover the 30-50% of oil remaining in it. Some methods recommend the alkali refining of the oil to remove free fatty acids, followed by a treatment with sulphuric acid prior to the treatment with bleaching earth. Methods have been recommended in which the oil is stirred for two hours with 4 per cent of bleaching earth, filtered, and then treated with superheated steam at 0.5 atmosphere pressure until the free acidity falls to 0.5 per cent. For