at the present time in place of hard fats particularly for the impregnation of heavy leathers. Most of the heavy petroleum oils as used in leather appear to suffer no alteration over ordinary periods of time and hence have some advantage over fatty oils for this reason.

Waxes such as carnauba are very little used in leather but are used in important amounts as ingredients of leather finishes to which they contribute gloss and a certain amount of proofing against water damage.

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CHROMATOGRAPHIC SEPARATION OF A MIXTURE OF PALMITIC, STEARIC AND OLEIC ACIDS. Carmela Manunta. *Helv. Chim. Acta, 22,* 1156-60 (1939). A mixt. of equal parts of the 3 acids was dissolved in petr. ether and percolated thru a chromatographic column of dried $MgSO_4 1/2H_2O$. A nearly complete sepn. was obtained. The palmitic acid remained in the upper part of the column and the stearic acid in the lower part of the relatively barren zone between. The oleic acid was not adsorbed. Similar results were obtained with a column of franconite. (*Chem. Abs.*)

EMULSIFYING AGENTS FOR MARGIN. O. K. Palladina. *Masloboino Zhirovoe Delo 1939,* No. 2, 30-2. — Directions are given for polymerizing glycerol, preferably to triglycerol (mol. wt. 270). Exhaustive esterification of the polyglycerol with a suitable fatty acid, using 0.2% MgO or 1% anhydrous Na_3PO_4 as catalyst, is the next step in making an active emulsifier. A phosphatide group, esterified once with hydroxyethyltrimethylammonium hydroxide, provides a potent hydrophilic group. A good emulsifier for margarin should be miscible with water and should be effective at 0.5% concn. in fat-water mixts. (*Chem. Abs.*)

MODIFICATION OF FAT IN FROZEN PORK MEAT AFTER PROLONGED STORAGE. Ie. I. Novikova. *Kholodil 'naya Prom. 16,* No. 4, 30-5 (1938); — If the meat is kept at — 18°, there is no change in the fat over a period of 1 yr. If stored at — 8°, the fat undergoes chem. and organoleptic changes. The surface layer yellows (even in 6 months) and acquires a stearic taste; in 1 yr. the phenomenon has penetrated to a depth of 0.25-0.40 cm. Frozen pork meat should therefore not be stored at -8° for more than 3-4 months. (*Chem. Abs.*)

THE EFFECT OF COD LIVER OIL AND FISH MEAL ON THE FLAVOR OF POULTRY PRODUCTS. E. M. Cruickshank. *Proc. 7th World's Poultry Congr., Cleveland 1939,* 539-42. — Prolonged feeding of rations contg. fish oils causes an increase in the degree of unsatn. of both body fat and yolk fat.

ADULTERATION OF CHAD BUTTER, ITS DETECTION, VALUE OF THE VALENTA NUMBER. P. Creach. *Ann. fals. 32,* 4-16 (1939). — The various forms of adulteration likely to be encountered in this butter, made in Chad, are discussed. The most frequent ones are the addn. of arachis, sesame and Balanites aegyptica. Sesame oil is readily detected in amts. of 2.5% (and even as little as 1-1.5%) by the Villavecchia and Fabrics color test. The Valenta test (crit. soln. temp. in glacial AcOH) is suitable for detection in the field of the above oils, as well as of castor oil and beef and mutton fats, which also may occasionally be encountered as adulterants (*Chem. Abs.*)

POSSIBLE DELETERIOUS EFFECTS OF USING SOAP SUBSTITUTES IN DENTIFRICES. Sidney Epstein, A. H. Throndson, Wm. Dock and M. L. Tainter. *J. Am. Dental Assoc. 26,* 1461-71 (1939). — Na lauryl sulfate and Na lauryl sulfoacetate, which are used as detergents in certain dentifrices, were irritating to the nose. They produced extensive conjunctivitis in rabbits, similar to, but more intense than, that produced by soap U. S. P. (*Chem. Abs.*)

RICINUS COMMUNIS. I. OXIDATION OF RICINOLEIC ACID. St. Elmo Brady. *J. Am. Chem. Soc. 61,* 3464-7 (1939). Summary: The oxidation of ethyl ricinoleate in dry acetone yields the liquid acids, caproic, heptylic and caprylic; and the solid acids, β-hydroxypelargonic acid, azelaic, suberic, and an acid of m.p. 96°. The oxidation of ricinoleic acid in alkaline permanganate solution at 0° gave two trihydroxstearic acids already known, m.p. 110° and 141°, respectively, in approximately equal amounts. The oxidation of ricinelaidic acid, on the other hand, gave a large percentage of the acid, m.p. 110°, and a small amount of the acid, m.p. 141°. The oxidation of both the trihydroxystearic acids obtained from ricinoleic and ricinelaidic acids, resp., with periodic acid, resulted in the same products. β-hydroxypelargonic aldehyde and aldehydoazelaic acid.

A METHOD FOR THE PREPARATION OF α, β-DIGLYCERIDES OF FATTY ACIDS. B. F. Daubert and C. G. King. *J. Am. Chem. Soc. 61,* 3328-30 (1939). A new method for synthesis of α, β or 1,2-diglycerides has been described, in which sodium glyceroxide and benzyl chloroformate served as intermediates. Good yields were obtained and the reaction conditions made it possible to avoid the common β — to α — shift in structure. 1,2-dipalmitin, m.p. 64°, 1,2-dimyristin, m.p. 59° and 1,2-dibenzoate of glycerol, m.p. 59°, were prepared and their structures were verified by making derivatives of known constitution. A solution of 1,2-dipalmitin in 0.1 to 0.25 N alcoholic hydrochloric acid and ammonia underwent a rapid change in structure, but the analogous 1,2-dibenzoate was stable under the same conditions of exposure.

THE DISTRIBUTION OF THE FATTY ACIDS IN HALIBUT INTESTINAL OIL, WITH A NOTE ON THE PRESENCE OF FREE FATTY ACIDS IN THE INTESTINES OF FISH. John Arnold Lovern and Richard Alan Morton. *Biochem. J. 33,* 1734-9 (1939). A large quantity of halibut intestines was extracted with ether and the resulting oil was partially separated into its components, the processes used being alkali-washing, acetone precipitation and crystallization and molecular distillation. The products separated for examination included free fatty acids, phosphatides, vitamin and cholesterol esters and a "neutralized" oil. The fatty acids recovered from these products were quantitatively analysed and it is shown that both vitamin A and cholesterol were esterified with all the various fatty acids present, the amounts of the different esters being proportional to

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the relative amounts of the acids present in the main fatty extract. This evidence is in harmony with the hypothesis that vitamin A assists in fat absorption processes. The fatty acids of the phosphatide fraction were appreciably different from those of the main fat fraction and it seems unlikely that this phosphatide was directly concerned in fat absorption. The probable presence of free fatty acid in the living intestine is indicated and the bearing of this on vitamin-assisted fat absorption is discussed.

SPECTROSCOPIC CHANGES IN FATTY ACIDS. IV. ACIDS FROM SPECIMENS OF BUTTER FAT FROM COWS UNDER DIFFERENT NUTRITIONAL TREATMENTS. James Houston, Albert George Cotton and Stanislaw Kazimierz Kon, and Thomas Moore. *Biochem. J. 33,* 1826-9 (1939). Fractions of the mixed liquid fatty acids obtained by high vacuum distillation of the butter fat of cows at pasture showed spectroscopic absorption at 230 mu. The intensity of this absorption increased rapidly with the ascending I.V. of the fractions, in agreement with the conclusion that spectroscopic absorption is attributable to polyethylenic acids. Similar results were obtained for the fractions of the liquid acids from the butter of cows given cod liver oil. According to the I.V., the content of polyethylenic acids was greater than that in the fractions from the pasture butters, and the spectroscopic absorption at 230 mu was relatively more intense. No evidence was obtained of the transference to the milk of the acids present in cod liver oil "pro-absorbtive" at 270 mu. Tung oil was poorly tolerated by cows, but small doses resulted in the appearance of spectroscopic absorption at 270 mu in the butter acids at an intensity suggesting the inclusion of about 0.5% of unchanged elaeostearic acid. There was no evidence of the increased absorption at 230 mu reported in the hen and rat when given tung oil. THE EFFECT OF THE DIETARY FAT ON THE BODY FAT AND EGG FAT OF THE HEN. Ethel Margaret Cruickshank, James Houston, and Thomas Moore. *ibid* 1630-4. Fatty acids from the egg and abdominal fats of hens given diets with no added oil, or with the inclusion of sperm oil or linseed oil contained polyethylenic acids in the "pro-absorptive" state. The dietary fat had a marked effect on the amount of polyethylenic acids present in the egg fat as revealed by spectroscopic examination after refluxing with KOH. Similar effects were observed for the abdominal fat. With sperm oil added to the diet the increases of absorption after refluxing with KOH were about equally great at 230 and 270 mu. With the diet free from fat, and with linseed oil included, the increase in absorption at 230 mu was greater than at 270 mu. The inclusion in the diet of tung oil which absorbs intensely at 270 mu caused a marked increase in the preformed spectroscopic absorption at 230 mu in the egg and the body fatty acids. This change in the position of the absorption maximum is probably to be ascribed to the loss of one of the conjugated unsaturated linkages of elaeostearic acid. The above results suggest that there are marked differences in the treatment of polyethylenic acids by the cow and the hen.

SPECTROSCOPIC CHANGES IN FATTY ACIDS. VI. GENERAL. Thomas Moore. *Biochem. J. 33,* 1635-8 (1939). Catalytic reduction of tung oil caused a change in the position of the absorption maximum of the mixed acids from 270 to 230 mu, i.e. the same change which occurs in vivo when tung oil is fed to a hen or rat. This finding supports the conclusion that absorption in polyethylenic acids at 270 mu is caused by three conjugated unsatd. linkages, absorption at 230 mu by two such linkages. Evidence has been obtained supporting the view that the change underlying increased absorption in polyethylenic acids when submitted to prolonged refluxing with KOH is a reorientation of the unsatd. linkages from unconjugated to conjugated positions. When large amounts of "pro-absorptive" polyethylenic acids are included in the diet of the rat they are stored in the fat deposits in unchanged spectroscopic state. The predominance of absorptive acids found in the fats of some mammals, e.g. the cow, cannot therefore be made the basis of a general rule. The absorption of the acids from rats receiving an almost satd. fat (coconut oil) suggests however that when the intake of polyethylenic acids is low these are largely converted into the absorptive form. Polyethylenic acids from dried grass were found to be in the "pro-absorptive" form. It appears therefore that "absorptive" acids present in the fats of herbivorous animals such as the cow must be converted in the animal.

ACTION OF LINOLENIC AND LINOLEIC ACIDS (VITAMIN F) ON ALLERGIC DISEASES. L. Herlitzka and S. Montuori. *Riv. patol. sper. 22,* 69-84 (1939). — In allergic diseases the unsatd. fat acids diminished (*I* no. lowered). Administration of linolenic and linoleic acids (termed vitamin F) increased the *I* no. and caused transitory or permanent disappearance of the symptoms. (*Chem. Abs.*)

FUNGISTATIC PROPERTIES OF THE FATTY ACIDS AND POSSIBLE BIOCHEMICAL SIGNIFICANCE. Charles Hoffman, T. Robert Schweitzer, and Gaston Dalby. *Food Res. 4,* 539-45 (1939). — The fungistatic properties of the normal saturated fatty acids containing from one to 14 carbon atoms have been studied over a pH range of from pH 2 to pH8. Many of these acids exhibit remarkable effectiveness in the inhibition of mold growth. This effectiveness varies according to the chain length, the concentration of the acid, and the pH of the media. A branched chain acid, in general, is less effective fungistatically than the corresponding straight chain acid. Unsaturation tends to increase the fungistatic effectiveness of an acid. At neutrality, the acids containing eight to 12 carbon atoms are the most effective for the inhibition of mold growth. This biochemical fact suggested that the nutritional value of these fatty acids be studied in relationship to certain types of disease. The hypothesis has been advanced that the shorter chain fatty acids may be important in the human dietary.

PATENTS

PROCESS OF REFINING VEGETABLE AND ANIMAL OILS. O. E. Fröding (to The DeLaval Separator Co.). *U.S.*

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2,181,563. A cooling step is interposed between the heating and separating step in a continuous refining process.

Alkyl 12-ketosterate. H. L. Cox (to Union Carbide & Carbon Corp.). *U.S. 2,180,730.* A 12-ketosterate acid ester of an aliphatic alc. The products are used as stabilizers and plasticizers in lacquer and plastic compns. formulated from natural and synthetic gums and resins.

Process for manufacturing sebacic acid. H. A. Bruson & L. W. Covert (to Röhm & Haas Co.). *U.S. 2,182,056.* A functional deriv. of ricinoleic acid is heated with NaOH in aq. soln. at a temp. between 250° and 300° C in a closed vessel to yield sebacic acid.

Treatment of glycerin lyes and of crude glycerin. R. H. Potts and E. W. Colt (to Armour & Co.). *U.S. 2,182,179.* Water insol. solvents which do not substantially dissolve glycerin are used to remove certain org. impurities from glycerin lyes before processing the lyes for glycerin. Water insol. fatty acids are used as solvents.

Process of refining animal & vegetable oils. B. Clayton, W. B. Kerrick, H. M. Stadt, and B. H. Thurman (to Refining, Inc.). *U.S. 2,182,755.* A continuous process for refining is characterized by the avoidance of any substantial period of contact of the refining reagent with the oil after the admixing thereof.

Abstracts

Soaps

Edited by M. L. SHEELY

Detergent value of triethanolamine soaps. George W. Fiero. *J. Amer. Pharm. Assn. 28,* 285 (1939). Using commercial fatty acids isolated from cocoanut oil, tallow, and ordinary red oil, the detergency of their triethanolamine soaps was as follows: Tallow fatty acids soap removed 23.4% of a total of 29.5% soil; cocoanut fatty acids soap removed 21.7% of a total of 30.0% soil; and red oil soap removed 21% of a total of 30.2%. The author concludes that none of the triethanolamine soaps has the detergent action possessed by ordinary soap. (*Amer. Perfumer*).

Steam distillation of glycerine under reduced pressure. S. Ueno and C. Yonese. *J. Soc. Chem. Ind. (Japan) 42,* 10, 342B (1939). The quantities of distilled glycerine obtained from soap-lye glycerin and recovered crude glycerine are respectively 81.8 and 62.5% of that from saponification crude glycerine. It is concluded that with the same plant and nearly equal conditions, the quality of crude glycerine seems to exert an influence upon the distillation efficiency. (*Chem. Abs.*).

The twitchell process. J. H. Wigner. *Soap, Perfumery and Cosmetics 12,* 979 (1939). The objection most often made to this process is that it produces soap of a bad color. This is no longer true when the new purified reagents are used, which are lighter in color and considerably more active, so that a much smaller quantity can be used. Discoloration owing to oxidation can be avoided by the exclusion of air, and neutralization with barium chloride of the small amount of mineral acid contained in the fatty acids. As to costs of the process, it may safely be asserted that in almost all cases the gains in glycerin and alkali yielded by this process outweigh the expenses, but it is impossible to give any figure to represent the profit which would apply to all works, as many variable factors have to be taken into consideration. The saponifier acts as an emulsifier to bring about intimate contact between the fat and the water and as a catalyst to promote hydrolysis. The action begins at once and is relatively rapid at first, but the rate of transformation is very nearly proportional to the amount of glyceride present, which is constantly decreasing as the operation proceeds. The yield in the first 12 hours may be of the order of 65 to 85%, and in the first 24 hours, 85 to 90%, and in the next 24 hours, it may only amount to about 5 or 10%. Probably about 95% may be looked on as a practical limit. The time for the complete operation varies from about 44 to 48 hours. A detailed method of determining the split as the process continues, is given. Equipment is also described.

Sulphite cellulose lyes for soap making. Paul I. Smith. *Amer. Perfume 39,* [6], 37 (1939). The general experience of soapers who have experimented with lignin sulphonate is that it is an exceedingly difficult substance to use owing to the marked tendency of the soap preparation to discolor. This may be due to several reasons, particularly to the action of free moisture in the soap and the breakdown of the lignin molecule due to the free alkali used to build up the soap. There is also the risk of the newly formed alkali-lignin body to cause discoloration of the paper wrapper used for packaging the soap, or lining barrels or other containers. The present writer considers that it is unlikely, and there is no conclusive evidence to the contrary, that the addition of lignin sulphonate improves the detergent action in the same way as phosphate or silicate, and it can, therefore, only be regarded as a filler with rather doubtful potentialities.

Density and viscosity of glycerol solutions at low temperatures. Edmund Green and John P. Parke. *J. Soc. Chem. Ind. 58,* 319 (1939). To provide data required in connection with the use of glycerol