of oil (I. Kaganowicz, *Tluszcze i Srodki Piorace 6*(2), 71 (1962).

Two patents on hydrogenation included a process for fatty materials using nickel on silica gel catalyst, temperature from 50–240C and hydrogen pressure ranging from atmospheric to 4000 psig (W. H. Flank, *U.S. 3,123,627*), and a continuous process in which the glycerides were passed through a bed of solid catalyst made up of nickel and sulfur on silica support at 100–400F with hydrogen pressures from 10–150 psig (F. W. Kirsch, *U.S. 3,123,626*).

Hydrogenated rapeseed oils varied in composition reflecting varying selectivity of the commercial hydrogenation processes (A. Jakubowski et al., *Prace Inst. Lab. Badawczych Przemyslu Spozywczego 13*(1), 41 (1963). Nickel was removed best from hydrogenated oils with 0.25% bleaching earth plus 0.02% citric acid (A. Rutkowski et al., *Zeszyty Nauk. Wyzszej Szkoly Rolniczej Olstynie 13*(3), 397 (1962).

A mathematical derivation was developed to determine the selectivity of catalysts for selective hydrogenation of linolenic acid in soybean oil to counteract the undesirable flavor reversion properties of soybean oil (C. H. Riesz and H. S. Weber, *JAOCS 41*, 380 (1964). Applicability of a small analog computer to a study of the kinetics of hydrogenation was presented. Analog computer techniques facilitated the empirical method of trial and error, successive approximation and curve matching and permitted the prediction of the composition of the reaction mixture as a function of reaction time (R. O. Butterfield et al., *Ibid. 41*, 29 (1964).

To obtain a hydrogenated product without reversion of taste and odor, the deodorization of pre-refined whale oil before hydrogenation was recommended (F. G. Gladkaya et al., *Maslob—Zhir. Prom. 29*(11), 43 (1963).

PARTIAL ESTERS AND INTERESTERIFICATION

Three new methods for production of mono- and diglycerides were described. Mono- and diglycerides were produced in high concentration by direct esterification using p-toluenesulfonic acid catalyst and with continuous removal of water of esterification by azeotropic distillation (A. T. Gros. and R. O. Feuge, *JAOCS 41*, 727 (1964). Glycerolysis of oleostearine with NaOH catalyst as 205C for 2 hr yielded a product containing 49% monoglyceride. One recrystallization from hexane, CCl_4, $CHCl_3$ or trichloroethylene gave a product having 77–93% monoglyceride (M. H. Bertoni et al., *Rev. Argent. Grasas y Aceites 5*, 43 (1963). In the production of monoglycerides from refined animal and vegetable fats by glycerolysis the use of cyclohexanone instead of furfural showed good results (S. Tsuda and N. Wada, *Osaka Furitsu Kogyo—Shoreikau Hokoku 25*, 49 (1961).

Substantially complete random rearrangement of glyceride esters containing less than 0.1% free fatty acids was effected with an alkali catalyst. At the end of the reaction citric acid or H_3PO_4 was added to inactivate the catalyst and to split the soap formed (*Can. 672, 715*). Milk fat was rearranged using selected times, temperatures and catalyst concentrations to yield a product resembling butter. The catalyst concentration had more influence on the hardness than did reaction time or temperature (J. B. Mickle et al., *J. Dairy Sci. 46*, 1357 (1963). The smallest amount of EtONa to transesterify a mixture of 35% lard and 65% rape oil was 0.15% by weight. The reaction was completed in 2 min at 85C and in 1 min at 115C (C. Kaczanowski and A. Jakubowski, *Tluszcze i Srodki Piorace 7*(2), 67 (1963). Fatty acids were esterified with MeOH or BuOH in a specially designed apparatus. When H_2SO_4, or Me—$C_6H_5SO_3H$, was used as catalyst the reaction time was less than 1 hr while catalysts like Cl SO_3H, HCl or H_3PO_4 needed about 5 hr (Hermann Stage, *Chemiken—Ztg. 87*(18), 661 (1963).

Interesterification of fats and oils was reviewed (E. Servent, *Lipidos 23*, 81 (1963).

FAT SPLITTING

An apparatus for continuous splitting of fats was described (I. M. Torbin and E. E. Fainberg, *Maslob—Zhir. Prom. 30* (5), 34 (1964). Splitting of fat was carried out in 80 ft towers operating at 700–750 lb/sq in. pressure and at 460–500F with high pressure steam (H. W. Ladyn, *Chem. Eng. 71*(7), 106 (1964).

Twitchell reagents were uneconomical for splitting of nigerseed, tobaccoseed, safflower, pongam, cottonseed, peanut, chaulmoogra and mahua oils. But dodecylbenzene sulfonic or alkylnaphthalene sulfonic acid catalysts at concentrations of 1–2% gave 90% splitting of all oils in 8–10 hr (C. S. P. Rao et al., *Indian J. Technol. 1*(12), 457 (1963). In the Twitchell method of fat splitting, 80–90% split occurred in about 12 hr with Duolite C-20 cation exchanger and 83% split was obtained with H_2SO_4. However, the fatty acids obtained with resin catalyst had a much lighter color. Further, the resin could be regenerated (S. D. T. Rao and C. S. P. Rao, *Chem. Age* (India) *14*, 476 (1963).

BY-PRODUCTS

A process for preparing full fat soybean flour for human consumption by "Extrusion-Cooking" method was developed (C. G. Mustakas et al., *JAOCS 41*, 607 (1964). Methods for utilizing soybean oil phosphatides in soapstocks were reviewed (F. Ramos, *Grasas Aceites 14*, 171 (1963). Extraction of cottonseed flake containing 5–8% moisture with nonpolar solvent followed by polar solvent decreased the free gossypol content to less than 0.1%. Increasing the temperature to 200–300F for 0.5–2.0 hr at 10–20% moisture level also decreased the gossypol content (W. W. Meinke and Raymond Reiser, *U.S. 3,124,461*). An oil cake containing a maximum of soluble protein and free sugar and a minimum of free and bound gossypol was obtained by extracting with a mixture of liquid and gaseous carbon tetrachloride (V. P. Rzehin et al., *Trudy Uniiz 23*, 70 (1963).

Tocopherol concentration would be commercially feasible only from tocopherol rich dehydration distillate of oil deodorization (H. Niewiadomski and Drozdowski, *Roczniki Technol. Chem. Zywnocsi 9*, 57 (1962). Nitrogen solubility index, optical density of aqueous extracts and reducing sugar content correlated with the protein quality of processed mustard seed (J. E. McGhee et al., *JAOCS 41*, 359 (1964). The economics of the recovery of glycerol obtained by saponification of animal fats was discussed (Mark Krnic, *Kem. Ind. (Zagreb) 12* (4), 231 (1963).

The Annual Review of Literature will be continued in October

• *New Literature*

STURDILITE PRODUCTS, INC., manufacturers of laboratory and industrial furniture, has described its expanded line of modular furniture in its 1965 catalog, No. 563. (919 North Michigan Ave., Chicago, Ill.)

PARR INSTRUMENT CO., has issued their new Calorimeter Catalog, No. 65-1, which lists combustion bombs, calorimeters, automatic calorimeter control systems and calorimeter accessories. (211 Fifty-third Street, Moline, Illinois.)

GALLARD-SCHLESINGER CHEMICAL MFG. CORP. has issued "Organic and Inorganic Research Chemicals," Catalogue No. 5. (580 Mineola Ave., Carle Place, L.I., New York 11514.)

• *Names in the News*

Two staff members of Atlas Chemical Industries' technical center—Paul Becher (1954) research scientist, and William C. Griffin (1954) associate director of produce development—have been named joint recipients of the 1964 Literature Award of the Society of Cosmetic Chemists. The award consists of a prize of $1,000 and a scroll, and is presented annually at the society"s Spring Technical Meeting in New York City.

J. T. Goodwin, Jr., has been appointed Director of the Department of Chemistry and Chemical Engineering at Southwest Research Institute. For the past seven years he served as Vice-President for Research of the Corn Industries Research Foundation, Inc.