

• Biochemistry and Nutrition

5,6-TRANS-25-HYDROXYCHOLECALCIFEROL: VITAMIN D ANALOG EFFECTIVE ON INTESTINE OF ANEPHRIC RATS. M.F. Holick, M. Garabedian and H.F. DeLuca (Dept. of Biochem., College of Agr. and Life Sci., Univ. of Wisc., Madison, Wisc. 53706). *Science* 176, 1247-8 (1972). A new compound, 5,6-trans-25-hydroxycholecalciferol, has been synthesized and tested for its biological activity. Like 1,25-dihydroxycholecalciferol, it stimulates intestinal calcium transport in anephric rats, whereas 25-hydroxycholecalciferol does not. But this analog has little if any activity in stimulating mobilization of calcium from the bone of anephric rats.

INVOLVEMENT OF PHOSPHOLIPIDS IN THE D-GLUCOSE UPTAKE ACTIVITY OF ISOLATED HUMAN ERYTHROCYTE MEMBRANES. A. Kahlenberg and B. Banjo (Lady Davis Inst. for Med. Res., Jewish Gen. Hosp., and Dept. of Experimental Med., McGill Univ., Montreal, Quebec). *J. Biol. Chem.* 247, 1156-60 (1972). A method for measuring the stereospecific uptake of D-glucose by isolated human erythrocyte membranes has recently been developed. Data obtained with this method were interpreted to suggest that the uptake activity measured represented the binding of D-glucose to a specific site on the erythrocyte membrane. To investigate the possible role of phospholipids in this D-glucose uptake activity, the phospholipid structure of erythrocyte membranes was modified by treatment with phospholipase A₂, C or D, and the effect of each modification on their D-glucose uptake activity and phospholipid composition was determined. The above results suggest that perturbation of phospholipid hydrophobic groups in the interior of the membrane, proximal or hydrophobically bound to membrane proteins, causes a decrease in the D-glucose uptake activity of these proteins.

RECONSTITUTED LIVER MICROSOMAL ENZYME SYSTEM THAT HYDROXYLATES DRUGS, OTHER FOREIGN COMPOUNDS AND ENDOGENOUS SUBSTRATES. A.Y.H. Lu, R. Kuntzman, Susan West, M. Jacobson and A.H. Conney (Dept. of Biochem. and Drug Metabolism, Hoffmann-La Roche Inc., Nutley, N.J. 07110). *J. Biol. Chem.* 247, 1727-34 (1972). The liver microsomal hydroxylation system which metabolizes drugs and steroids was separated into fractions containing cytochrome, cytochrome reductase and lipid, all of which are needed for maximal catalytic activity. The enzyme system isolated from rats treated with either phenobarbital or 3-methylcholanthrene has been fractionated, and the role of the hemoprotein, lipid and reductase fractions in influencing substrate specificity has been studied. The results obtained indicate that the specificity for hydroxylation resides primarily in the cytochrome fraction, rather than in the reductase or lipid fraction.

STUDIES ON THE BIOLOGICAL PROPERTIES OF POLYENE ANTI-BIOTICS. A.W. Norman, R.A. Demel, B. deKruyff and L.L.M. Van Deenen (Biochemisch Lab., State Univ. of Utrecht, Vondellaan 26, Utrecht, The Netherlands). *J. Biol. Chem.* 247, 1918-29 (1972). The polyene antibiotic, filipin, has been shown previously to mediate changes in membrane permeability in natural and artificial biological membranes. The concept has emerged that the interaction of filipin is dependent upon the presence of sterol, preferably cholesterol. The present report provides strong evidence that filipin can interact with sterols in a stereochemically and stoichiometrically defined manner to produce a filipin-sterol complex or adduct. These results suggest that filipin can interact stoichiometrically with cholesterol and that in membrane systems this interaction is capable of altering some of the physical properties of the membrane, thus providing a basis for filipin-induced changes in membrane permeability.

STUDIES ON THE NATURE OF THE INHIBITION BY GOSSYPOL OF THE TRANSFORMATION OF PEPSINOGEN TO PEPSIN. Rosie C.

Wong, Y. Nakagawa and Gertrude E. Perlmann (Rockefeller Univ., New York, N.Y. 10021). *J. Biol. Chem.* 247, 1625-31 (1972). Pepsinogen reacts with gossypol to form gossypol-pepsinogen, a zymogen which cannot be activated to pepsin. This modified protein was digested with Nagarse followed by partial acid hydrolysis with 0.03 N HCl at 110°C for 40 hours. The gossypol-containing portion of the molecule was isolated and purified by gel filtration on Sephadex G-15 and LH-20 columns and countercurrent distribution by means of a isobutanol, pyridine and acetic acid system. The material thus purified was found to be a decapeptide originating from the NH₂-terminal portion of the protein and a heptapeptide obtained from the COOH terminus. The two peptides were cross-linked by gossypol through the 2-NH₂ groups of Lys₅₁₈ and Lys₅₂₅. As indicated by gel filtration on Sephadex G-200 and by sodium dodecyl sulfate-polyacrylamide electrophoresis, it is apparent that intra- as well as intermolecular cross-linkages may occur. Furthermore, the optical rotatory dispersion and circular dichroism differ from those of pepsinogen.

STUDIES ON THE BIOSYNTHETIC CONVERSION OF CHOLESTEROL INTO PREGNENOLONE. B. Luttrell, R.B. Hochberg, W.R. Dixon, P.D. McDonald and S. Lieberman (Dept. of Biochem., of Obstetrics and Gynecology, and the Internat'l Inst. for the Study of Human Reproduction, College of Physicians & Surgeons, Columbia Univ., New York, N.Y. 10032). *J. Biol. Chem.* 247, 1462-72 (1972). (20R)-20-*t*-Butyl-5-pregnene-3β,20-diol, an analog of 20α-hydroxycholesterol, has been synthesized and its metabolism studied. Since C-22 in this synthetic compound is completely substituted, this position is unavailable for biological oxygenation. When injected intravenously into a rabbit, the *t*-butyl analog is metabolized to urinary pregnanediol. When incubated with sonicated mitochondria from bovine adrenal glands, it is converted into pregnenolone. Two mechanisms consistent with these findings are proposed; both predict the involvement of reactive, transient, intermediate complexes which are represented simply either as radical or ionic species. However, the actual mechanism may best be imagined to be some hybrid of these two extreme processes. These and other results form the basis of a new hypothesis for the pathways used for the biosynthesis of pregnenolone from cholesterol. In this scheme, the traditional side chain-hydroxylated compounds are not obligatory intermediates; rather, they are considered to be by-products resulting from competitive reactions of short lived, reactive species.

SOME STUDIES ON THE BIOSYNTHESIS OF UBIQUINONE, ISOPRENOID ALCOHOLS, SQUALENE AND STEROLS BY MARINE INVERTEBRATES. M.J. Walton and J.F. Pennock (Dept. of Biochem., Univ. of Liverpool, Liverpool L69 3BX, U.K.). *Biochem. J.* 127, 471-9 (1972). The ability of fourteen marine invertebrates to utilize mevalonate-¹⁴C for the biosynthesis of isoprenoid compounds was investigated. Several of the animals, in particular crustaceans, bivalve molluscs, a coelenterate and a sponge, were unable to synthesize squalene and sterols, whereas gastropod molluscs, echinoderms, an annelid and a sponge could. Regardless of sterol-synthesizing ability, the animals (with the exception of a sponge) always made dolichol and ubiquinone, and thus a specific block in squalene and sterol synthesis was indicated in some animals. Radioactivity accumulated in relatively large amounts in farnesol and geranylgeraniol in those animals incapable of making sterols.

METABOLISM OF OESTRADIOL-4-¹⁴C BY OESTROGEN-INDUCED UTERINE PEROXIDASE. C.R. Lyttle and P.H. Jellinek (Dept. of Biochem., Queen's Univ., Kingston, Ont., Canada). *Biochem. J.* 127, 481-7 (1972). An enzyme that catalyses the metabolism and binding of oestradiol-4-¹⁴C to protein and to other high-molecular-weight substances in the presence of H₂O₂ was shown to be absent from the uteri of immature rats and to be induced by physiological doses of oestrogen or pregnant-mare-serum gonadotrophin. The pH optimum, stability to heat and other characteristics of the uterine enzyme system as well as its subcellular distribution were determined. The increase in the ability of uterine preparations to convert oestradiol-4-¹⁴C into water-soluble products as a result of oestrogen treatment was accompanied by an increase in peroxidase and NADH oxidase activities and was inhibited by actinomycin D and cycloheximide. The results support the proposal that the increase in peroxidase activity after oestrogen treatment might be part of an adaptive response of the uterus permitting it

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to bind and inactivate oestrogens and thus limit the duration of their effect upon this target tissue.

A PHOSPHOLIPASE IN *BACILLUS MEGATERIUM* UNIQUE TO SPORES AND SPORANGIA. D.M. Raybin, L.L. Bertsch and A. Kornberg (Dept. of Biochem., Stanford Univ. Schl. of Med., Stanford, Cal. 94305). *Biochemistry* 11, 1754-60 (1972). A phospholipase activity which first appears in sporulating *Bacillus megaterium* is then found in mature, free spores. The enzyme is released from spores during germination or by mechanical disruption. The phospholipase is not essential for germination because it is destroyed by heating that does not affect the viability of the spore. The enzyme released from germinated spores behaves as a water-soluble enzyme and has been purified 170-fold to near homogeneity. It is characterized as specific in cleaving the 1-acyl linkage. The purified enzyme requires either a nonionic or anionic detergent for a negatively charged substrate, phosphatidylglycerol, but an anionic detergent

(sodium taurocholate) for hydrolysis of neutral phospholipids. Thus the enzyme seems to prefer negatively charged substrate-detergent complexes. The phospholipase activity in sporangial extracts has properties similar to those of the purified spore enzyme, including A₁ specificity, pH and detergent responses and the lack of any requirement for calcium or magnesium ions.

REGULATION OF MICROSOMAL ENZYMES BY PHOSPHOLIPIDS. V. KINETIC STUDIES OF HEPATIC URIDINE DIPHOSPHATE-GLUCURONYLTRANSFERASE. D.A. Vessey and D. Zakim (Div. of Molecular Biol., Vet. Admin. Hosp., San Francisco, Cal. 94121). *J. Biol. Chem.* 247, 3023-8 (1972). A bisubstrate kinetic analysis of UDP-glucuronyltransferase (EC 2.4.1.17) has been carried out in forward and reverse directions with *p*-nitrophenol as aglycone. Reciprocal plots of initial rates of activity indicated that the kinetics followed a sequential mechanism. Product inhibition studies, using UDP and *p*-nitrophenylglucuronide as inhibitors of the forward reaction, gave a pattern of two competitive and two noncompetitive inhibitions, compatible with a rapid equilibrium, random order kinetic mechanism, or an ordered mechanism of the Theorell-Chance type. Isotope exchange experiments, however, excluded an ordered mechanism. Comparison of the kinetic parameters for the forward and reverse directions showed that the rate at V_{max} is 2-fold greater for the reverse than for the forward reaction. At finite substrate concentrations, however, the forward reaction is favored because of the 100-fold higher affinity of the enzyme for *p*-nitrophenol than for its glucuronide. It was also observed that high concentrations of *p*-nitrophenol and *o*-aminophenol have nonspecific activating effects on UDP-glucuronyltransferase. The importance of these findings for the design and interpretation of kinetic experiments is discussed.

Northeast Section schedules talk on dimer acids

Arthur N. Wrigley, Chairman of the AOCS Northeast Section Meeting to be held in Philadelphia on October 24, 1972, announced that the topic of that evening's talk will be "Dimer Acids."

Fred O. Barrett, Manager of New Dimer and Ozone Products Area, Organic Chemicals Div., Emery Industries, Inc., will discuss the chemistry, manufacture and postulated structures of dimers, as well as the properties and reactions of dimer acids that lead to a number of end use applications. A brief survey of the markets for dimers and dimer derivatives will also be included.

Barrett has been associated with Emery Industries since 1948. During that time he has engaged in derivatives research in fats and oils, including the early work in catalytic dimerization of unsaturated fatty acids, polyamides and ozone chemistry. Prior to joining Emery, he was with the Procter & Gamble Co.

The dinner meeting will be held at the Franklin Motor Inn, the Parkway and 22nd Street, Philadelphia, Pa.

Dates set for 1972-73 meetings

The following plans have been made for meetings of the AOCS Northeast Section during 1972-73.

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| September 12, 1972 | Awards Night Speaker: A.N. Wrigley (Achievement Award Recipient), "Fatty Cononomers" Robin Hood Inn, Clifton, N.J. Chairman: M. Ejjadi |
| October 24, 1972 | Speaker: F. Barrett, "Dimer Acids" Franklin Motor Inn, Philadelphia, Pa. Chairman: A.N. Wrigley |
| December 5, 1972 | Plant Trip, Mennen Co., Morristown, N.J. Black Bull Restaurant Chairman: J. Munson |
| February 13, 1973 | Testimonial Dinner to Ernest Drew Speaker: P. Kalustian, "History of Fats and Oils Industry" Chemists' Club, New York, N.Y. Chairman: F. Naughton |
| April 10, 1973 | Annual Symposium, on "Palm Oil" Robert Treat Hotel, Newark, N.J. Chairman: W. Burkholder |
| June 5, 1973 | Speaker: to be determined, "Margarine Formulations in Manufacturing" Robin Hood Inn, Clifton, N.J. Chairman: G. Jacobson ■ |

PURIFICATION AND PROPERTIES OF FATTY ACYL THIOESTERASE I FROM *ESCHERICHIA COLI*. W.M. Bonner and K. Bloch (J.B. Conant Chem. Labs., Harvard Univ., Cambridge, Mass. 02138). *J. Biol. Chem.* 247, 3123-33 (1972). Fatty acyl thioesterase activity in crude *Escherichia coli* extracts consists of two activities separable by gel filtration. The two enzymes are designated thioesterases I and II from the order in which they are eluted from Sephadex G-100. Thioesterase I, after 8400-fold purification, was homogeneous as judged by acrylamide gel electrophoresis and constant specific activity of the enzyme peak on DEAE-Sephadex. The native enzyme is a tetramer with a molecular weight of 122,000 and a subunit molecular weight of 30,000. Saturated and unsaturated fatty acyl-CoA thioesters of chain length C₁₄ to C₂₈ were the most active substrates with K_m values of 4 to 6 μM and turnover numbers of 18,000 and 27,000 per min, respectively. Neither acetyl-CoA nor oxygen esters were hydrolyzed at detectable rates. Of the many active site reagents tested only photo-activated methylene blue and iodoacetamide inhibited thioesterase I. Acid hydrolysis of thioesterase I inhibited with iodoacetamide-¹⁴C yielded glycolic acid-¹⁴C as the major radioactive product, while mild base hydrolysis yielded mainly glycolamide-¹⁴C. The evidence presented indicates that iodoacetamide inhibits thioesterase I by esterifying an essential carboxyl group.

STRUCTURE AND BIOSYNTHESIS OF THE HYDROXY FATTY ACIDS OF CUTIN IN *VICIA FABAE* LEAVES. P.E. Kolattukudy and T.J. Walton (Dept. of Agr. Chem., Washington St. Univ., Pullman, Wash.). *Biochemistry* 11, 1897-1907 (1972). Cutin, the lipid polymer which is the structural component of cuticle, was isolated from *Vicia faba* leaves by a combination of enzymatic and chemical techniques. Exhaustive hydrogenolysis of powdered cutin followed by thin-layer chromatography and a combination of gas chromatography and mass spectrometry showed that this cutin was composed of 10,16-dihydroxypalmitic acid (77.8%), 9,16-dihydroxypalmitic acid (7.1%), 16-hydroxypalmitic acid (7.1%), palmitic acid (3.6%), stearic acid (2.2%) and oleic acid (0.8%). These results suggest that a mixed-function oxidase-type enzyme catalyzes the direct hydroxylation at C-10 of ω-hydroxypalmitic acid.

ISOLATION AND CHARACTERIZATION OF 17β-HYDROXY STEROID DEHYDROGENASE FROM HUMAN ERYTHROCYTES. E. Mulder, G.J.M. Lamers-Stahlhofen and H.J. Van Der Molen (Dept. of Biochem., Div. of Chem. Endocrinology, Med. Faculty at Rotterdam, Rotterdam, The Netherlands). *Biochem. J.* 127, 649-59 (1972). The 17β-hydroxy steroid dehydrogenase was solubilized during haemolysis of erythrocytes and was isolated from the membrane-free haemolysate. Membrane preparations

isolated in different ways did not contain 17β -hydroxy steroid dehydrogenase activity. The 17β -hydroxy steroid dehydrogenase activity in the haemolysate was concentrated by repeated ammonium sulphate precipitation and gel filtration on Sephadex G-150. The 17β -hydroxy steroid dehydrogenase activity of the purified preparation per unit weight of protein was 350-3000 times higher than the activity of the crude erythrocyte haemolysate. The 20α -hydroxy steroid dehydrogenase activity was lost during this purification procedure. The 17β -hydroxy steroid dehydrogenase was NADP-dependent and had a pH optimum for conversion of testosterone between 8.5 and 10. For the molecular weight of the enzyme a value of 64,000 was calculated from Sephadex chromatography results. When both reduced and oxidized cofactors were present, the oxidation of the 17β -hydroxyl group was inhibited to a considerable extent.

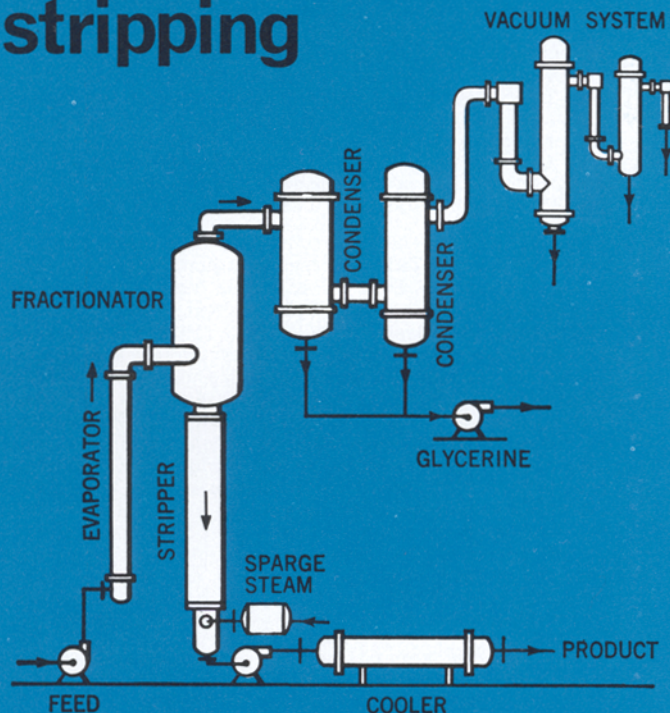
MECHANISM OF ACTION OF VITAMIN A IN DIFFERENTIATION OF MUCUS-SECRETING EPITHELIA. L. De Luca and G. Wolf (Dept. of Nutr. and Food Sci., Mass. Inst. of Tech., Cambridge, Mass. 02139). *J. Agr. Food Chem.* 20, 474-6 (1972). A discussion of the evidence for a mechanism of action of vitamin A at the transcriptional, translational and post-translational levels is presented. The conclusion that retinol may be acting at the posttranslational level is based on the following findings. The *in vivo* and *in vitro* biosynthesis of a specific glycopeptide is greatly decreased in vitamin A deficiency. This glycopeptide contains D-fucose, D-galactose, D-glucosamine, D-galactosamine and D-sialic acid in the molar ratios 1.00:1.73:0.87:1.97:0.49, respectively. By indirect immunofluorescence the glycopeptide was localized in the goblet cell. The number of these cells, as revealed by periodic acid-Schiff staining, was greatly decreased in vitamin A deficiency. When H^3 -retinol and guanosine-diphosphate-mannose- ^{14}C are incubated in the presence of a membrane-rich fraction from rat or hamster liver or intestinal mucosa, a double-labeled mannolipid is isolated. This mannolipid can donate mannose to endogenous acceptors. These findings strongly suggest that retinol may be functioning in the biosynthesis of glycoproteins by carrying monosaccharides.

VITAMIN E. REGULATION OF THE BIOSYNTHESIS OF PORPHYRINS AND HEME. P.P. Nair, H.S. Murty, Priscilla I. Caasi, Sherry K. Brooks and J. Quartner (Biochem. Res. Div., Dept. of Med., Sinai Hosp., Baltimore, Md. 21215). *J. Agr. Food Chem.* 20, 476-80 (1972). Vitamin E deficiency in the rat leads to a decrease in the activity of hepatic δ -aminolevulinic acid dehydratase, the second enzyme in the biosynthetic pathway to heme. Since this was accompanied by lower concentrations of microsomal cytochrome P_{450} and b_5 , as well as by lowered activities for hepatic catalase and tryptophan pyrrolase, the existence of a defect in heme synthesis in these animals is postulated. This was confirmed by following the incorporation of labeled δ -aminolevulinic- ^{14}C and porphobilinogen- ^{14}C into microsomal protoheme. Vitamin E was also found to have a second locus of action in blocking the induction of hepatic δ -aminolevulinic synthase and dehydratase by phenobarbital and allylisopropylacetamide. Structure-activity studies using several other substituted tocopherols and a group of synthetic antioxidants revealed that the action of vitamin E (α -tocopherol) in this system is not mediated by a mechanism similar to that of the antioxidants.

CARNITINE AND BROWN ADIPOSE TISSUE METABOLISM IN THE RAT DURING DEVELOPMENT. P. Hahn and J. Skala (Dept. of Paediatrics and Obstetrics and Gynaecology, Faculty of Med., Univ. of British Columbia, Vancouver Gen. Hosp., Vancouver, B.C., Canada). *Biochem. J.* 127, 107-111 (1972). The content of carnitine, acylcarnitine and total acid soluble carnitine in brown adipose tissue of rats increases rapidly after birth, attaining a peak on about day 10 and then decreases. Similar changes with age were found for carnitine acetyltransferase activity in mitochondria from brown adipose tissue and heart. The activity of this enzyme in brain and in liver is much smaller, but also increases postnatally. The activity of carnitine palmitoyltransferase in brown adipose tissue, however, decreases after birth then increases later in life. Exposure of 18-day-old rats to the cold for 20 days leads to an increase in carnitine content in brown adipose tissue and raises the activity of carnitine acetyltransferase. The activity of carnitine palmitoyltransferase is not affected by cold adaptation.

REGULATION OF RETINOL-BINDING PROTEIN METABOLISM BY VITAMIN A STATUS IN THE RAT. Y. Muto, J.E. Smith, P.O. Milch and D.S. Goodman (Dept. of Med., Columbia Univ.

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College of Physicians and Surgeons, New York, N.Y. 10032). *J. Biol. Chem.* 247, 2542-50 (1972). Retinol circulates in rat plasma bound to a specific protein, retinol-binding protein (RBP). A radioimmunoassay for rat RBP was developed with a double antibody precipitation technique. The immunoassay accurately measures RBP in amounts of 0.5 to 3 ng per assay tube. There was no significant difference in the immunoreactivity of apo-RBP as compared to holo-RBP. When vitamin A was administered orally to deficient rats on Day 53, a very rapid increase in serum RBP level, from a mean of 14 to 56 μg per ml, was seen within 5 hours (the first time interval sampled). These findings suggest that vitamin A deficiency primarily interferes in some way with the secretion, rather than with the synthesis, of RBP by the liver, and that the deficient liver contains a pool of previously formed apo-RBP which can be released rapidly into the serum, as holo-RBP, when vitamin A becomes available.

FURTHER STUDIES ON THE LIPIDS OF CORYNEBACTERIA. THE MANNOLIPIDS OF CORYNEBACTERIUM AQUATICUM. G.K. Khuller and P.J. Brennan (Dept. of Biochem., Trinity College, Dublin 2, and Dept. of Biochem., Univ. College, Dublin 4, Republic of Ireland). *Biochem. J.* 127, 369-73 (1972). The major free lipids of *Corynebacterium aquaticum* were characterized as dimannosyl diglyceride, monomannophosphoinositide and phosphatidylethanolamine. Bisphosphatidylglycerol and phosphatidylglycerol were also tentatively identified. We regard this as the only well-documented case of an organism containing monomannophosphoinositide to the exclusion of dimannophosphoinositides and the higher homologues. The co-existence of the two mannolipids in one organism is a distinctive feature. So also is the presence of phosphatidylethanolamine in a corynebacterium. The monomannophosphoinositide apparently does not utilize phosphatidylinositol as a precursor, unlike the monomannophosphoinositide of *Propionibacterium shermanii*, CDP-diglyceride may be necessary for its synthesis.

METABOLISM OF FATTY ACIDS BY BOVINE SPERMATOZOA. A.R. Neill and C.J. Masters (Animal Res. Inst., Yeerongpilly, Brisbane, Queensl. 4105, Australia). *Biochem. J.* 127, 375-85 (1972). The incorporation of ^{14}C -labelled myristic, palmitic, stearic, oleic and linoleic acids in vitro into the lipids of bovine spermatozoa was measured at intervals from 2 min to 2 h. All acids were rapidly incorporated into diglycerides, myristic acid being metabolized to the greatest extent. Whereas the low incorporation of acids into total phospholipids reflected the relative stability of the major phospholipid fractions in sperm, the minor phospholipids, particularly phosphatidylinositol, showed comparatively high metabolic activity. Although, in general, saturated acids were incorporated more actively than unsaturated substrates, stearic acid was poorly incorporated into all lipids except phosphatidylinositol. In regard to fatty acid composition of sperm lipids it was notable that diglycerides contained myristic acid as the major component, and this acid was also a prominent moiety of phosphatidylinositol. Docosahexaenoic acid was the principal fatty acid of the major phospholipid classes. These findings have been discussed in relation to the role of lipids in the metabolism of spermatozoa.

STUDIES ON DRUG-INDUCED LIPIDOSIS. III. LIPID COMPOSITION OF THE LIVER AND SOME OTHER TISSUES IN CLINICAL CASES OF "NIEMANN-PICK-LIKE SYNDROME" INDUCED BY 4,4'-DIETHYLAMINOETHOXYHEXESTROL. A. Yamamoto, S. Adachi, K. Ishikawa, T. Yokomura, T. Kitani, T. Nasu, T. Imoto and M. Nishikawa (Second Dept. of Int. Med., Osaka Univ. Med. Schl., Fukushima-ku, Osaka). *J. Biochem.* 70, 775-84 (1971). Lipid composition of liver and some other tissues was determined in seven cases of "foam cell syndrome" which was induced by the administration of 4,4'-diethylaminoethoxyhexestrol dihydrochloride. Free cholesterol and total phospholipids were increased in the liver. Phospholipid analysis showed marked increases in lysobisphosphatidic acid and phosphatidylinositol in liver. An increase in lysobisphosphatidic acid was also detected in spleen, muscle, lymph nodes and

urinary sediment. However, this phospholipid was not increased in leucocytes. Accumulation of 4,4'-diethylaminoethoxyhexestrol itself was detected by thin-layer chromatography of total lipids. Gas chromatographic analysis of the total sterol showed an increase in desmosterol in tissues and in blood serum. The syndrome resembles Niemann-Pick disease in some respects. Discussion is made on the mechanism of accumulation of the peculiar glycerophospholipid, lysobisphosphatidic acid.

MECHANISMS OF ENZYME AND SUBSTRATE ACTIVATION BY LIPO-PROTEIN LIPASE COFACTORS. I. A SPECIFIC REQUIREMENT OF PHYSIOLOGICAL CONCENTRATIONS OF CALCIUM FOR ENZYME ACTIVITY. I. Posner and A. Morales (Lab. de Endocrinologia, Hosp. Central de las Fuerzas Armadas, Barrio Union, San Martin, Caracas, Venezuela). *J. Biol. Chem.* 247, 2255-65 (1972). Lipoprotein lipase can hydrolyze triglyceride emulsions formed by incubation of triolein coated on solid supports in the presence of serum albumin, but only after substrate activation by a serum cofactor. The hydrolysis of serum chylomicrons and very low density lipoproteins by the enzyme can be enhanced by serum, but much faster reaction rates are observed in the presence of Ca^{2+} . Because of this fact and in view of the low range of Ca^{2+} concentrations required for enzyme activation, a physiological role for the metal in the in vivo hydrolysis of these natural substrates of the enzyme outside the fat cells of adipose tissue is proposed.

EFFECT OF LINOLEIC ACID RESERVES ON ESSENTIAL FATTY ACID DEFICIENCY OF THE CHICK. D.A. Roland, Sr. and H.M. Edwards, Jr. (Poultry Sci. Dept., Univ. of Georgia, Athens, Ga. 30601). *Poultry Sci.* 51, 382-9 (1972). Experiments were conducted to study the influence of EFA-deficiency on growth and development of male and female chicks and to determine the influence of linoleic acid reserves and age on susceptibility to essential fatty acid deficiency. When the birds were fed the basal essential fatty acid-deficient diet, the females grew faster than the cockerels. After 7 months there was very little difference in the weight of the females on the experimental diets (basal 2,588 grams vs. basal + 5% corn oil 2,679 grams), but there was considerable difference between the males (basal 2,497 grams vs. basal + 5% corn oil 3,814 grams). The birds fed the corn-soy diet less than 4 weeks and then fed the basal diet were EFA deficient when 12 weeks of age. Thus the increase in growth rate and the decrease in the triene-to-tetraene ratio are proportional to the number of days the chicks are fed a fat-supplemented diet before being fed a fat-deficient diet.

FINE STRUCTURE OF THE CYCLIC RHYTHM OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE. DIFFERENTIAL EFFECTS OF CHOLESTEROL FEEDING AND FASTING. D.J. Shapiro and F.W. Rodwell (Dept. of Biochem., Purdue Univ., Lafayette, Ind. 47907). *Biochemistry* 11, 1042-5 (1972). Rat liver microsomal 3-hydroxy-3-methylglutaryl (HMG)-CoA reductase (mevalonate:NADP-oxidoreductase (acylating CoA), EC 1.-1.1.34) undergoes striking cyclic variations which are dependent on protein synthesis. Short duration (10-18 hr) cholesterol feeding resulted in an overall decline in reductase activity from 6 p.m. to midnight. Activity in rats fasted 10-18 hr increases severalfold during this time. The different effects of cholesterol feeding and fasting suggest that they may regulate HMG-CoA reductase through different mechanisms.

THE INHIBITION OF CROTON OIL-PROMOTED MOUSE SKIN TUMORIGENESIS BY STEROID HORMONES. S. Belman and W. Troll (Dept. of Environmental Med., New York Univ. Med. Center, New York, N.Y. 10016). *Cancer Res.* 32, 450-4 (1972). Tumors in female Swiss Millerton mouse skin were initiated with 25 μg 7,12-dimethylbenz(a)anthracene and, 2 weeks later, were promoted 3 times/week with 0.2 ml of 0.5% croton oil. Four steroid hormones in 0.2 ml of acetone were applied percutaneously at 6 and 30 μg 5 times/week. A fifth steroid was applied at the 30- μg dose. Tumor inhibition by the hormones was dose dependent in the order dexamethasone > Schering No. 11572 > prednisolone > hydrocortisone > cortisone. There was a general correlation between the anti-inflammatory and antitumor activities of the steroids.

SERUM CORTISOL, PLASMA FREE FATTY ACIDS AND URINARY CATECHOLAMINES AS INDICATORS OF COMPLICATIONS IN ACUTE MYOCARDIAL INFARCTION. R. Prakash, W.W. Parmley, M. Horvat and H.J.C. Swan (Dept. of Cardiology, Cedars-Sinai Med. Cntr., Los Angeles, Cal.). *Circulation* 45, 736-45 (1972). Levels of serum cortisol, plasma free fatty acids (FFA) and urinary catecholamines were collected in 31 patients with acute myocardial infarction on the day of admission to the

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coronary care unit (samples obtained from 15 patients with diseases other than myocardial infarction were considered as controls). These values were correlated with the presence or subsequent development of left ventricular failure, arrhythmias, shock or death. Sixteen of 17 infarction patients without the above complications had cortisol levels less than 20 $\mu\text{g}\%$; 10 of 12 patients with complications had higher cortisol levels. All of the infarction patients without complications had plasma FFA levels less than 1100 $\mu\text{Eq/liter}$, while six of nine patients with complications had levels of 1100 $\mu\text{Eq/liter}$ or higher. Fourteen of 16 patients without complications had urinary catecholamines less than 12.5 $\mu\text{g}\%$, while seven of 10 patients with complications had levels greater than this. Of interest were a few patients without complications on admission, but with elevated cortisol or FFA levels, who developed complications on the following day. The results of the present study suggest that the generalized metabolic stress of acute myocardial infarction results in elevations of cortisol, FFA and catecholamines as measurable biochemical indicators and/or predictors of the severity of the infarction.

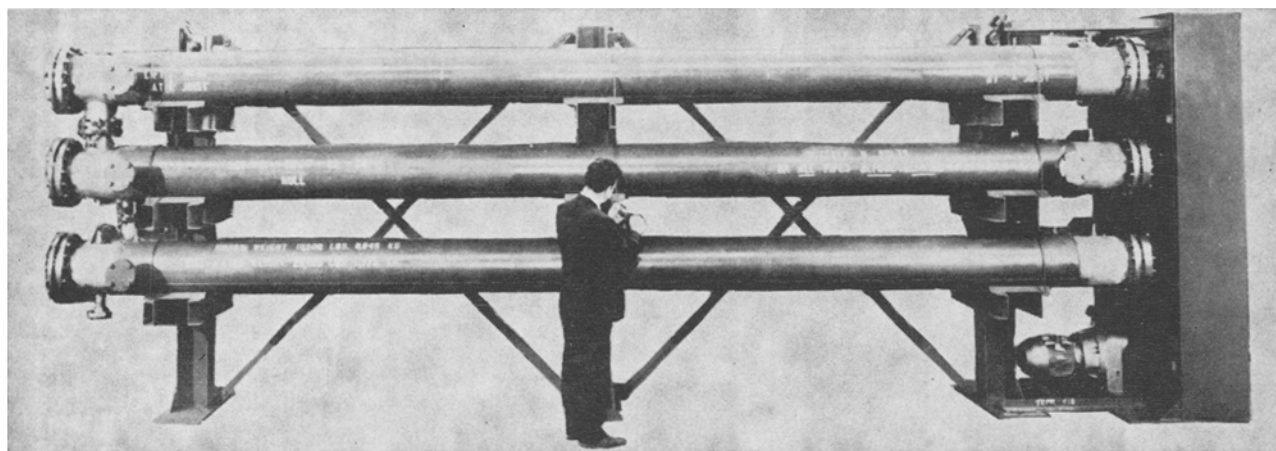
TYPE IV HYPERLIPOPROTEINEMIA IN A CONSANGUINOUS FAMILY. M. Amidi (Catheterization Unit, Pahlavi Univ., Shiraz, Iran). *Circulation* 45, 988-90 (1972). The involvement of all five offspring of consanguinous and hypertriglyceridemic parents (first cousins) is reported. Three sons and two daughters of this family have increased triglycerides, normal cholesterol and normal or slightly increased phospholipids. Mother and elder daughter have abnormal glucose tolerance. Father and mother are hypertensive; father had recent development of myocardial infarction and gout. The two elder sons had myocardial infarction and repeated bouts of angina. All three male offspring of this family have gout and are being treated with xanthinoxidase inhibitor (allopurinol). Planar xanthoma was present in one son with myocardial infarction. No chylomiconemia was noted. The response to diet and Atromid-S was satisfactory.

STIMULATION BY ACETYLCHOLINE OF PHOSPHATIDYLINOSITOL LABELLING. SUBCELLULAR DISTRIBUTION IN RAT CEREBRAL-CORTEX

SLICES. E.G. Lapetina and R.H. Michell (Dept. of Biochem., Univ. of Birmingham, Birmingham B15 2TT, U.K.). *Biochem. J.* 126, 1141-7 (1972). Rat cerebral-cortex slices were incubated with ^{32}P , acetylcholine and eserine for periods of 10 min and 2 h. The specific radioactivity of phosphatidylinositol was elevated during these treatments by 36 and 106% respectively. The specific radioactivities of the phosphatidylinositol in different cell structures were determined after subcellular fractionation. They were highest in the nuclear, microsomal and synaptic-vesicle fractions and lowest in myelin, both in the controls and in the acetylcholine-treated slices. The stimulated labelling of phosphatidylinositol was relatively evenly distributed: no subcellular fraction showed a stimulation markedly higher than that in the homogenate. Studies of the distributions and activities of marker enzymes indicated that the subcellular fractionation achieved was similar to that with fresh tissue. The results are discussed in relation to the previous report that the stimulation is observed throughout the neuronal cell-bodies and in relation to the hypothesis that the labelled phosphatidylinositol produced by stimulation is a component of an acetylcholine-receptor proteolipid localized in the synaptic junction.

LIPID METABOLISM BY RAT LUNG IN VITRO. UTILIZATION OF CITRATE BY NORMAL AND STARVED RATS. R.W. Scholz (Dept. of Vet. Sci., Penn. State Univ., Univ. Park, Pa. 16802). *Biochem. J.* 126, 1219-24 (1972). The utilization of citrate- $1,5\text{-}^{14}\text{C}_2$ by lung slices and cell cytosol preparations, and the activities of liver and lung cytosol citrate-cleavage enzyme (EC 4.1.3.8), L-malate-NAD oxidoreductase (malate dehydrogenase, EC 1.1.1.37) and phosphoenolpyruvate carboxylase (EC 4.1.1.32) were examined in normal and starved rats. Lipogenesis from citrate was decreased by approximately 70% in both the phospholipid and neutral lipid fractions of lung slices from starved rats as compared with fed controls. Incorporation of citrate by lung cytosol preparations into fatty acids was decreased by approximately 35% in the starved rats. The apparent inhibition by avidin of fatty acid synthesis was overcome partially by preincubation of lung

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cytosol preparations with biotin. These results are consistent with the presence in lung tissue of the malonyl-CoA pathway for fatty acid synthesis. Lung citrate-cleavage enzyme activity decreased in rats that had been starved for 72h whereas malate dehydrogenase and phosphoenolpyruvate carboxylase activities remained unchanged. The results suggest that the pattern of utilization of lipid precursors by rat lung may be altered during various nutritional states.

LIPID INTERMEDIATES IN THE BIOSYNTHESIS OF THE WALL TEICHOIC ACID IN STAPHYLOCOCCUS LACTIS 13. Helen Hussey and J. Baddiley (Microbiol. Chem. Res. Lab., School of Chem., Univ. of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU, U.K.). *Biochem. J.* 127, 39-50 (1972). Particulate enzyme systems have been prepared from *Staphylococcus lactis* 13 which effect the synthesis of wall teichoic acid (a polymer containing a repeating unit in which D-glycerol 1-phosphate is attached to the 4-position on N-acetylglucosamine 1-phosphate) from the nucleotide precursors CDP-glycerol and UDP-N-acetylglucosamine. By using nucleotides labelled with ³²P and ¹⁴C it has been shown that the synthesis proceeds via lipid intermediates. Two intermediates have been found. In one of these N-acetylglucosamine 1-phosphate is present, whereas in the other the repeating unit of the teichoic acid occurs. The simultaneous formation of the teichoic acid, a poly(N-acetylglucosamine 1-phosphate) and an unidentified lipid, together with the poor ability of most particulate systems to synthesize polymer and the instability of the lipid intermediates themselves, have interfered with pulse-labelling experiments. Nevertheless, the biosynthetic sequence has been elucidated. It is concluded that the intermediates are derivatives of undecaprenol phosphate.

THE LIPID-TEICHOIC ACID COMPLEX IN THE CYTOPLASMIC MEMBRANE OF STREPTOCOCCUS FAECALIS N.C.I.B. 8191. P. Toon, P.E. Brown and J. Baddiley (Microbiol. Chem. Res. Lab., Schl. of Chem., Univ. of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU, U.K.). *Biochem. J.* 127, 399-409 (1972). A lipid-teichoic acid complex was isolated from *Streptococcus faecalis* N.C.I.B. 8191. The covalent nature of the linkage between teichoic acid and lipid was established. The complex exhibits macromolecular properties in solution, and ultracentrifugation studies show that these are due to micelle formation. From chemical studies it is concluded that the teichoic acid is a poly(glycerol phosphate) in which some of the glycerol hydroxyl groups possess kojibiosyl [2-0- α -D-glucopyranosyl-(1 \rightarrow 2)- α -D-glucopyranosyl] substituents, together with D-alanine ester residues. The lipid is 1-kojibiosyl diglyceride, already known as a membrane component of this organism, with probably a phosphatidyl substituent. The phosphatidyl kojibiosyl diglyceride is attached to the teichoic acid through a phosphodiester linkage, and the chain of the teichoic acid contains 28-35 units. Although the complex represents the whole of the membrane teichoic acid in this organism, only about 12% of the membrane glycolipid is associated with teichoic acid. Two phosphatidyl glycolipids, closely resembling that bearing the teichoic acid, were isolated from the lipids of the organism and were partly characterized.

• Detergents

COMPATIBLE ANIONIC-CATIONIC SURFACTANT COMPOSITIONS. G. Barker (Witco Chem. Corp.). *U.S.* 3,668,136. The compositions comprise an anionic surfactant and certain cationic surfactants compatible with the anionic ones and in the form of quaternary ammonium compounds containing polyoxypropylene groups. The compositions exhibit improved foam and solubilizing characteristics.

FOAMED DETERGENT COMPOSITION. H.E. Crotty (Chemed Corp.). *U.S.* 3,668,153. Highly alkaline detergents for foam cleaning contain, as the foaming additive, sodium salts of fatty acid sulfonates, amine oxides, amido alkyl amine oxides, substitu-

tion derivatives of imidazoline alkanolic quaternary ammonium hydroxide and mixtures of these.

BUILDERS FOR SYNTHETIC DETERGENT COMPOSITIONS BASED ON CARBOXY-ETHYL DERIVATIVES OF POLYALCOHOLS. M.M. Tessler and M.W. Rutenberg (National Starch and Chemical Corp.). *U.S.* 3,669,890.

CLEANSING COMPOSITIONS ADAPTED TO EMIT VISIBLE LIGHT DURING USE. J.M. Greenwood and D.H. Stokes (Lever Bros.). *U.S.* 3,669,891.

INHIBITING AGENTS, WASHING COMPOSITIONS AND SOLUTIONS CONTAINING THEM. F.B. Clarke and J.W. Lyons (Monsanto). *U.S.* 3,669,893. The inhibiting agent is useful in compositions for washing glass articles. It consists of a combination of (1) sodium gluconate, (2) an aminophosphonate such as amino tri(methylene phosphonic acid) and (3) an alkylidene diphosphonic acid such as 1-hydroxy, 1-ethylidene diphosphonic acid.

DETERGENT COMPOSITIONS. H. Priestly and J.H. Wilson (Lever Bros.). *U.S.* 3,670,027. Novel sulfoxides having the general formula C₁₂H_{2x}(OCH₂CH₂)_x-S(O)-R are useful as sub-stabilizing additives. In the formula, x is 0 when R is a monovalent radical selected from the group consisting of glyceryl, acetyl, 2-chloroethyl, 2-iodoethyl, 2-mercaptomethyl ethyl, 2-methoxyethyl, 2-ethoxyethyl and 2-allyloxyethyl, and x is an integer from 1 to 2 when R is methyl. As an intermediate for the preparation of the sulfoxides, there is also disclosed the compound dodecyloxyethoxyethyl chloride.

DRY CLEANING DETERGENT. L. Dasch (Diamond Shamrock Corp.). *U.S.* 3,671,441. Dry cleaning compositions containing a combination of an amine oxide and a phosphate ester of a nonionic surfactant are shown to give optimum results with respect to the removal of all types of soils and particularly the removal of water soluble soils from articles being dry cleaned.

MIXTURES OF FATTY ETHERS OF POLYHYDRIC ALCOHOLS AND THEIR ANHYDRIDES. A.H. Sherman and J.D. Zech (Atlas Chemical Industries, Inc.). *U.S.* 3,671,458. Ether compositions of fatty epoxides and polyhydric alcohols and a process for preparing the ethers are disclosed. The ether compositions are excellent surfactants, being useful as antifoaming agents, emulsifiers and dispersants. They are more resistant to acid and alkali solutions than organic ester type surfactants.

HYDRATED EMULSIFIER. M.E. Norris (SCM Corp.). *U.S.* 3,671,459. An improved hydrated emulsifier having from 30 to 65% lipoidal emulsifier component emulsified with 70-35% water is disclosed. The improvement is the inclusion of at least 30% by weight of the lipoidal emulsifier of an edible alkoxyated partial fatty acid ester of glycerol.

PROCESS FOR CONTROLLING FOAMS IN AQUEOUS SYSTEMS. E.H. Shears and F.L. Encke (Arizona Chem. Co.). *U.S.* 3,671,461. Foam in aqueous media is controlled by compositions consisting of (1) ethylene oxide adducts of rosin, and (2) fatty acids.

PROTEIN SOLUBILIZING, WASHING, RINSING, AND SOAKING COMPOSITIONS. D. Walter, W. Fries, and E. Gotte (Henkel & Cie). *U.S.* 3,673,096. The compositions consist of (a) a dialkylidene sulfamide, or its salt, wherein the alkyl groups have 6-10 carbon atoms; and (b) a polyphosphate, silicate, aminopoly-carboxylic acid, or polyphosphonic acid. Components (a) and (b) are present in amounts of 0.5:99.5 to 1:3, by weight. These compositions are useful in solubilizing proteinaceous soil when used alone or in combination with other washing agent additives.

DETERGENT COMPOSITION AND PROCESS. P.M. Sabatelli and C.A. Brungs (Chemed Corp.). *U.S.* 3,673,098. The composition includes 10-50 parts of an alkaline detergent, 5-30 parts of a tetra-alkali metal pyrophosphate, 5-30 parts of an alkali metal nitrito triacetate, 0-5 parts of a water soluble nitrite, and 0-5 parts of a low foaming surfactant. The highly alkaline detergent composition has a very high tolerance for hard water and is highly effective for machine dishwashing.

EMULSIFIER SYSTEM. J.J. Jonas and E.H. Freund (Krafteo Corp.). *U.S.* 3,673,106. The emulsifier system comprises, in combination, fatty monoesters of polyhydric alcohols stabilized in the alpha crystalline form by a crystal transition inhibitor. Included are glycerol monoesters and 1,2-propylene glycol

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monoesters. The inhibitor is a non-surface active salt comprising atoms having strong electronegative charges. The system is especially effective for foam-type food products.

SURFACE-MODIFIED CELLULOSE. J.B. Edwards (Procter & Gamble). *U.S. 3,673,110*. An adsorbent mass useful in adsorbing dirt and anionic dye molecules in laundering operations and the like is prepared by modifying a cellulose substrate to render it anionic. Thereafter, the modified surface is coated with certain nitrogen compounds.

HYDROGENATED OLEFIN SULFONATE DETERGENT BARS. G.L. Woo (Chevron Res. Co.). *U.S. 3,673,122*. The bars comprise a mixture of the sodium and magnesium salts of hydrogenated olefin sulfonates having 10-25 carbon atoms and a plasticizing amount of water. The ratio of the sodium to the magnesium salt can vary from 2:1 to 1:20. The bars have improved slough loss and wear rate characteristics.

METHOD FOR THE MANUFACTURE OF MARBELIZED SOAP BARS. R.G. Matthaer (Lever Bros.). *U.S. 3,673,294*. The manufacture of marbelized toilet bars is accomplished by preparing two or more differently colored batches of soap or detergent particles. Appropriate portions of the particles are subsequently charged into a vacuum chamber and extruded in the form of a continuous log which is cut and stamped into individual soap bars. It is important that all batches of soap or detergent have the same viscosity and plasticity. The particles range from 3/16 to 3 inches in diameter and from 3/16 to 7 inches long.

CLEANING AGENTS COMPRISING AN ANIONIC SURFACTANT AND A SKIN-PROTECTING COMPONENT. G. Kaiser and G. Tauber (Farbwerke Hoechst). *U.S. 3,658,994*. Cleaning agents comprising anionic surfactants which may tend to irritate the skin in admixture with a skin-protection agent are disclosed. The protective agent is a dicarboxylic acid semi-amide of an alkylene diamine or of ethylene triamine.

LIQUID WASH CYCLE SOFTENER. R.R. Sepulveda and K.F. Schoene (Lever Bros.). *U.S. 3,660,286*. The softener contains a mixture of branched and straight chain di-higher alkyl and straight chain di-lower alkyl quaternary ammonium compounds with alkyl amine oxides. It imparts softness to fabrics in the presence of either anionic or nonionic detergents.

HIGH FOAMING MIXTURES OF FATTY ALCOHOL SULFATES. W.R. Axtell and E.G. De Witt (Ethyl Corp.). *U.S. 3,660,313*. Higher alcohol sulfate compositions are disclosed. They are primarily derivatives of mixtures of myristyl, palmityl and stearyl alcohols containing small quantities of alcohols of lower molecular weight.

LIME SOAP DISPERSANTS. D.G.S. Hirst (Procter and Gamble). *U.S. 3,660,470*. Alkylbenzene di-lower alkylammonio alkane-1 sulfonates have scum-dispersant properties and are effective in solid, granular, bar and liquid soap compositions. Compositions comprising higher fatty acid soaps and the alkylbenzyl di-lower alkylammonio alkane-1 sulfonates are described. Desirable results are obtained when the ratio of soap to zwitterionic is from 3:1 to 100:1.

DODECYLETHYL METHYL SULFIDES. H.M. Priestly and J.H. Wilson (Lever Bros.). *U.S. 3,660,497*. There are disclosed dodecyl acetyl sulfide, dodecyloxyethyl methyl sulfide, and dodecyloxyethoxyethyl methyl sulfide which are useful in the preparation of suds-stabilizing sulfoxides.

DETERGENT COMPOSITIONS CONTAINING STABILIZED α -AMYLASE. M. Desforges (Procter & Gamble). *U.S. 3,661,786*. The detergent, builder and α -amylase combination contains an amount of starch sufficient to stabilize the α -amylase.

SATURATED ALIPHATIC DICARBOXYLIC ACID SALTS AS DETERGENT BUILDERS. G.E. Brown, Jr. (Pollutrol Group). *U.S. 3,661,787*. The major portion of the builder salt is an alkali metal salt, or an ammonium salt (or mixtures of the two) of an aliphatic saturated polycarboxylic acid having a linear carbon chain of 2-10 carbon atoms. Salts of oxalic and succinic acids are preferred. No polyphosphates are required.

STABILIZED OXYGEN BLEACH-ACTIVATOR SYSTEM. G.G. Corey and B. Weinstein (American Home Products Corp.). *U.S. 3,661,789*. Oxygen releasing bleaches such as perborates are combined with activators and nonionic surfactants or glycols to provide compositions which are stable during storage under high temperature and humidity conditions.

WASHING AND CLEANSING AGENTS CONTAINING POLYAMIDES. E. Schmadel (Henkel & Cie). *U.S. 3,663,444*. The polyamide is the reaction product of (a) a polyalkylene imine of molecular weight 300-600 and (b) an organic polycarboxylic acid containing 2-10 carbon atoms. From 0.1% to 20% of this product is used in the washing composition which has improved dirt-carrying capacity.

SURFACE CLEANING AND DEFATTING COMPOSITION. H. Augustin, S. Klussendorf and K. Kofler (Lever Bros.). *U.S. 3,663,445*. Liquid storable concentrates comprise a nonionic surfactant, an alkanolamine salt of a fatty acid and an alkanolamine. The concentrates are diluted with water and are especially useful for metal surfaces.

DETERGENT COMPOSITIONS WITH CONTROLLED FOAMING CAPACITY. H. Barth, W. Griess, M. Knausenberger, H.-U. Menz and A. Segredos (Lever Bros.). *U.S. 3,663,446*. Foaming at low washing temperatures is obtained without overfoaming at higher temperatures. The thermo-controller is a substance of the general formula: HR_1-R-R_2COOZ where R represents a 6-carbon ring with one or more double bonds, R_1 and R_2 are hydrocarbon chains. Z is a hydrogen atom or a salt-forming element or a salt-forming group.

MOLDABLE SYNTHETIC DETERGENT. R. Susuki, H. Hoshi, J. Saito and K. Moriki (Raion Yushi Kabushiki Kaisha, Tokyo). *U.S. 3,663,449*. A synthetic detergent containing 25-95% sodium silicate and a small amount of polyhydric alcohol such as glycerine or ethylene glycol is molded in the same manner as synthetic resins to make a container. Various containers such as for detergent can be made of detergent itself.

DETERGENT BAR. R. Yoshida, M. Takehara, H. Akiba and Y. Usuba (Ajinomoto Co.). *U.S. 3,663,459*. The water soluble salts of N-acetylglutamic acids and N-acetylaspartic acids with alkali metals, ammonium, basic amino acids and other amines are milled with water and molded into bars by conventional procedures. The acyl groups are acyl radicals of saturated or unsaturated fatty acids containing 8-22 carbon atoms.

PARTIALLY SAPONIFIED ETHOXYLATED TRIGLYCERIDES OF RICINOLEIC ACID. G.M. Haynes (Whitestone Chemical Corp.). *U.S. 3,663,583*. Partially saponified castor oil surfactants are prepared by reacting an ethoxylated castor oil surfactant with 0.5-3.0 moles of an alkali metal hydroxide. The reaction products exhibit excellent detergency, low foaming characteristics, stability in both alkaline and acid solutions, complete water solubility and no cloud point in typical aqueous use solutions.

PROCESS FOR CONTINUOUS MANUFACTURE OF MARBELIZED SOAP BARS. R.W. Meye and G. Thor (Henkel & Cie). *U.S. 3,663,671*. The process involves the use of a soap plodder provided with a conical nozzle. Dye solutions are introduced into the soap mass through at least two inlets arranged at specific locations in the jacket of the plodder.

AQUEOUS TEXTILE SOFTENING COMPOSITION. B.C. Maske (American Cyanamid). *U.S. 3,664,952*. A cationic textile finish composition is disclosed for imparting softness to fibers, yarns and fabrics. The composition contains a quaternary ammonium compound formed from the reaction of a fatty alkanol amine ester and a quaternizing agent and a polyoxyethylated fatty compound.

ENZYME DETERGENT COMPOSITION CONTAINING COAGGLOMERATED PERBORATE BLEACHING AGENT. R. Norris (Procter & Gamble). *U.S. 3,664,961*. The composition contains a water soluble organic synthetic detergent, a water soluble builder, an enzyme, and 0.005-50% of a coagglomerated sodium perborate bleaching agent. The agent consists of sodium perborate, a water

(Continued on page 412A)

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• **Abstracts...**

(Continued from page 409A)

soluble polymeric organic agglomerating agent which forms a tacky solution with water at 72F, and a water soluble granular coagglomerant.

TEXTILE SOFTENING AGENT. S. Arai, M. Inouye, Y. Ogata, Y. Niimi and U. Nishimoto (Kao Soap Co.). *U.S. 3,666,661*. The agent contains an epichlorohydrin adduct of sorbitan higher fatty acid mono- or diester and an ethoxylated product of mono-, di-, or triglyceride of 12-oxytearic acid.

DETERGENT COMPOSITION AND PROCESS FOR SHAMPOOING HAIR. G. Kalopissis and G. Vanlerberghe (Societe L'Oreal, Paris). *U.S. 3,666,671*. The composition contains surface active compounds having the formula $RO-(CH_2C(CH_2X)HO)_nH$, where R is a lipophilic group, X is OH or halogen and n is 1-10.

ANTIMICROBIAL WASHING AGENTS. H.G. Nosler, R. Wessendorf, and H. Bellingner (Henkel & Cie). *U.S. 3,663,135*. The agents comprise (a) 0.2-30% of a nitroalkyl-N-phenylcarbamate, (b) at least 5% of an alkaline builder, and (c) other common components of washing compositions.

WASHING, BLEACHING, AND CLEANSING AGENTS CONTAINING POLY-(N-ACETIC ACID)-ETHYLENEIMINES. A. Werdehausen, A. Heins and M. Dohr (Henkel & Cie). *U.S. 3,650,692*. The composition contains from 0.1 to 50% by weight of a polyethyleneimine and the remainder the usual agents for such purposes. The imine is selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of 2,000-200,000 and (2) their alkali metal, ammonium, and organic ammonium salts. From 50-100% of the primary and secondary amine groups are carboxymethylated.

IODINE DETERGENT COMPOSITION. R.L. Bakka (Economics Laboratory). *U.S. 3,650,966*. Germicidal detergent compositions having low foaming properties and containing iodine are disclosed. The carrier is triethanolamine octyl sulfate. ■

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