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Horning (Inst. for Lipid Res., Baylor Univ. College of Med., Houston, Texas 77025). *Chem. Phys. Lipids* 3, 1–10 (1969). Ceramides may be subjected to direct separation and structural study by gas phase analytical methods. Suitable derivatives may be prepared by reaction with silylating reagents (leading to trimethylsilyl ether derivatives), and separations may be carried out with 1% SE-30 columns by temperature programming at 2C/min to 340–350C. The structure of individual ceramides is indicated by their mass spectra; both the acyl group and the sphingosine base moiety can be recognized in this way.

LIPIDS OF STREPTOMYCES SIOYAENSIS. V. ON THE 2-HYDROXY-13-METHYL-TETRADECANOIC ACID FROM PHOSPHATIDYLETHANOLAMINE. Jun'ichi Kawanami, A. Kimura, Y. Nakagawa and H. Otsuka (Shionogi and Co., Ltd., Fukushima-ku, Osaka, Japan). *Chem. Phys. Lipids* 3, 29–38 (1969). Phosphatidylethanolamine from *St. sioyaensis* afforded a double spot on a thin-layer chromatogram, typical of most glycosphingolipids from animal tissues. They were phosphatidylethanolamines one of which had only non-hydroxylated fatty acids and the other hydroxy fatty acids in addition to non-hydroxylated fatty acids, respectively. The distribution of the fatty acids was studied by hydrolysis with snake venom phospholipase A (E.C.3.1.1.4). Hydroxy fatty acids were located in the β-position of the glycerol moiety, differing from the results for *Brucella abortus* phospholipids in which location in the α-position has been reported. The main hydroxy fatty acid was purified by preparative gas-liquid chromatography. The structure of the hydroxy fatty acid was analyzed by oxidation with lead tetraacetate, proton magnetic resonance, mass spectrometry, etc. From these results, it was assumed that the main acid was 2-hydroxy-13-methyltetradecanoic acid.

A STUDY OF PALMITIC-STEARIC TRIGLYCERIDES AND THEIR BINARY MIXTURES BY DIFFERENTIAL THERMAL ANALYSIS (DTA). I. PURE TRIGLYCERIDES. R. Perron, Josiane Petit and A. Mathieu (Groupe de Laboratorires du C.N.R.S., 2 à 8, Rue Henry Dunant, 94, Thiais, France). *Chem. Phys. Lipids* 3, 11–28 (1969). The cryothermograms of the six pure triglycerides derived from palmitic and stearic acids have been determined by DTA. As well as revealing itself to be an excellent method of distinguishing between the positional isomers of the mixed triglycerides, DTA also showed that cooling the triglycerides from the melt at a rate of 1.2C/min yielded an α_L form (except PSP), which on subsequent heating gave the β_L form with the symmetrical triglycerides, but the β'_L form with the non-symmetrical triglycerides. In the process of cooling melted triglycerides, various forms may appear depending on the rate of cooling. The symmetrical triglycerides, with the exception of SSS, give stable forms more easily than the non-symmetrical triglycerides. Further, a sub-β'_L form can be detected in the case of PSP, PSS and SPP.

• Fatty Acid Derivatives

SYNTHESIS AND PROPERTIES OF SOME NEW C_{15}-OO-ALICYCLIC AND ACYCLIC ACIDS. A. K. Sen Gupta and H. Peters (Unilever Forschunglslaboratorium Hamburg, 2000 Hamburg 50, Behringstr. 154, Germany). *Chem. Phys. Lipids* 3, 371–85 (1969). The methyl esters of the following C_{15}-acids were synthesized: oo-cyclobutylundecanoic acid, oo-cyclopentydecanoic acid, 9-pentadecenoic acid and 6,12-pentadecadienoic acid. The melting points, refractive indices, surface tensions, gas chromatographic behaviour and IR-, NMR- and mass-spectral properties of these compounds were studied.

CATIONIC FABRIC SOFTENERS. W. P. Evans (Unilever). *Chem. Ind. (London)* 1969(27), 893–903. A review.

SHORTENING CONTAINING ETHOXYLATED PARTIAL GLYCEROL ESTERS. R. R. Egan, S. B. Lampson and I. A. MacDonald (Ashland Oil & Refining Co.). *U.S. 3,490,918.* The use of plastic and liquid shortenings containing an additive amount of an ethoxylated partial glycerol ester of a higher fatty acid is capable of enhancing the properties of foods prepared from such shortenings, especially bakery goods.

EMULSIFIER COMPOSITION FOR CAKES AND METHOD OF PREPARING CAKES UTILIZING THE SAME. J. B. Thompson (Eastman Kodak Co.). *U.S. 3,494,771.* A dispersion consisting essentially of a conjointly solidified mixture of propylene glycol monostearate and a monoglyceride, stearyl lactylic acid and water,

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• *Names in the News*

H. E. Robinson

Appointment of H. E. ROBINSON ('40) as corporate vice president of Research and Development for Swift & Co. was announced recently by that company's President, R. W. Reneker. Dr. Robinson has been President of Swift Chemical Co., Oak Brook, Ill., a division of Swift & Co., since it was organized as an autonomous division in 1968. Dr. Robinson has been with Swift since 1932. He was appointed director of laboratories in 1953; vice president of research in 1959; and corporate vice president with jurisdiction over chemicals for industry, adhesive products and gelatin in 1960. Dr. Robinson is President of the Institute of Food Technologists; a member of the American Oil Chemists' Society and the American Chemical Society.

A. SEHER, professor at the University of Münster, Germany, has accepted the position as Director of the Institute of General and Analytical Chemistry in the Federal Establishment for Fat Research, Münster, Dr. Seher has published extensively in scientific journals and handbooks, on methods for the analysis of lipids including sterols, and also of antioxidants and other food additives. Dr. Seher is expected to participate in the World Fat Congress at Chicago where he will present a paper "Qualitative and Quantitative Analysis of Sterols."

H. K. MANGOLD ('60), formerly professor of Biochemistry at the University of Minnesota, has left the Hormel Institute, Austin, Minnesota, and has accepted the position as Director of the Institute of Technology and Biochemistry, H. P. Kaufmann-Institute, in the Federal Establishment for Fat Research, Münster, Germany. Dr. Mangold is expected to present a paper "Alk-1-Enyl Acyl Glycerophosphatides in Plant Tissues" at the World Fat Congress at Chicago.

S. R. TANNENBAUM, Associate Professor, Department of Nutrition and Food Science, Massachusetts Institute of Food Technology, received the Institute of Food Technologist's Samuel Cate Prescott Award for Research at the 30th Annual Meeting of the Institute. The Award recognizes research scientists 35 years of age or younger for outstanding ability in research in some area of food science and technology. Dr. Tannenbaum's research has centered on food chemistry as applied to new sources of foods, development of new sources of calories and proteins, and stability of foods. He was cited for his research on stability of foods, his pioneering efforts in biochemical engineering and in the development of single cell proteins as a source of proteins for world nutrition, and for important contributions in the chemistry of composition and reactions in fish protein concentrate. He is the author of numerous papers and was the recipient of a Florasynth Fellowship in 1960–61 and a General Foods Fellowship in 1961–62.

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• *Obituaries*

JOHN A. BOULDEN ('21), AOCS Emeritus Member, died January 6, 1970. He was Plant Manager of Lever Bros. Co., Baltimore, Md.

Harvey L. Hutton ('52), Manager of Woodsen-Tenent Laboratories, Clarksdale, Miss., died in February, 1970.

H. E. Seestrom ('43), Engineer at Anderson-Clayton & Co., Foods Division, died June 1, 1970, in Farmers Branch, Richardson, Texas.

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is used as emulsifier for cake batters. The inventive concept includes the dispersion mixture, the cake batter containing the same, the cake made from the batter, a process for making the dispersion mixture and a process for making cake batter.

ESTERIFICATION OF FATTY ACIDS OF TALL OIL IN A HORIZONTAL DISTILLATION COLUMN AND CONDENSER. A. Spence (Spence & Green Chemical Co.). *U.S. 3,496,159.* Tall oil is subjected to a continuous vacuum fractional distillation in flat unimpeded horizontal evaporation and condensation zones. An alcohol is introduced into the evaporation zone to react with fatty acid vapors, forming esters. Tall oil liquid residue, resin acids as condensate and esterified fatty acids are separately recovered from the system. Iodine vapor can be added to the downstream end of the evaporation zone for reaction with higher boiling components.

THE PARTIAL SYNTHESIS OF SOME NATURALLY OCCURRING GLYCOSPHINGOLIPIDS WITH SPECIAL REFERENCE TO O-β-D-GALACTOSYL-(1 → 4)-O-β-D-GALACTOSYL-(1 → 1)-CERAMIDE. J. B. Hay and G. M. Gray (The Lister Inst. of Preventive Med., London, S.W.1). *Chem. Phys. Lipids* 3, 59–69 (1969). A procedure is described for the preparation of some naturally occurring glycosphingolipids by partial synthesis from natural ceramide (N-acylsphingosine). The ceramide was obtained in quantitative yield from sphingomyelin by the action of phospholipase C. It was converted to 3-O-benzoyl-ceramide which was then condensed with the chosen acetobromosugar in the presence of mercuric cyanide. Details of the preparations of O-β-D-glucosyl-(1 → 1) ceramide, O-β-D-lactosyl-(1 → 1)-ceramide and O-β-D-galactosyl-(1 → 4)-O-β-D-galactosyl-(1 → 1)-ceramide are given.

EFFECT OF METALLIC SALTS OF MONOALKYLPHOSPHATE ON THE CRITICAL ANTIWEAR LOAD OF GEAR OIL. Kyoichi Suga, Shoji Watanabe (Chiba Univ., Chiba, Japan), Akira Miyashige and Masaru Moriyama. *Yukagaku* 18, 911–14 (1969). Among various salts examined, Zn salt of monooleylphosphate and Zn, Ba, and Sn salts of mono-2-ethylhexylphosphate were excellent for protecting gear oil.

WATER-SOLUBLE ORGANIC CORROSION INHIBITORS FOR MILD STEEL. Kazuo Umehara and Yoichi Kato (Ind. Res. Inst., Aichi Pref., Nagoya, Japan). *Yukagaku* 18, 886–90 (1969). Na or amine salts of monobasic and dibasic acids were examined for inhibitive properties for mild steel in a humidity cabinet at 40 or 50C and relative humidity 95–100%. The acids studied include monocarboxylic, dicarboxylic, alkylphosphoric, dialkylthiophosphoric, *n*-octylphosphonic, and *n*-octylmalonic acids.

HYDROLYSIS OF PHOSPHOGLYCERIDES BY PURIFIED LIPASE PREPARATIONS. II. PREPARATION OF UNSATURATED 2-MONOACYL CHOLINE PHOSPHOGLYCERIDES. A. J. Slotboom, G. H. DeHaas, G. J. Burbach-Westerhuis and L. L. M. VanDeenen (Lab. Biochem., State Univ. of Utrecht, Utrecht, The Netherlands). *Chem. Phys. Lipids* 4, 30–36 (1970). A number of 3-sn-phosphatidylcholines having an unsaturated fatty acid moiety esterified at the 2-position were 1-specifically hydrolyzed by purified lipase preparations (EC3.1.1.3). The unsaturated 2-monoacyl choline phosphoglycerides formed, were purified by elution on Sephadex LH-20. The purity of these compounds was confirmed by thin-layer chromatography, while phospholipase A (EC3.1.1.4) hydrolysis revealed that the unsaturated fatty acid ester was almost exclusively located at the 2-position. Starting from 3-sn-phosphatidylcholines carrying a ^{14}C-labeled unsaturated fatty acid ester at the 2-position this method turned out to be suitable for the preparation of unsaturated ^{14}C-labeled 2-monoacyl choline phosphoglycerides.

PREPARATION OF LONG-CHAIN DIETHYL ALKENYL-PHOSPHONATES. I. RADICAL ADDITION OF PHOSPHORUS TRICHLORIDE TO α-OLEFINES, CHLOROPHOSPHONATION OF α-OLEFINES AND THE REACTION OF β-BROMOALKENES AND TRIETHYL PHOSPHITE. Tsutomu Nitta, Yoshiki Okamoto, and Hiroshi Sakurai (Osaka Univ., Suita, Osaka, Japan). *Yukagaku* 18, 747–50 (1969). Diethyl octenylphosphonate was prepared from oct-1-ene by 3 methods: (1) free radical addition of PCl_3 initiated with peroxide, (2) chlorophosphonation by the system oct-1-ene-PCl_3-O_2, and (3) the Arbuzov reaction of triethyl phosphite with octenyl bromide prepared by treating oct-1-ene with N-bromosuccinic imide. The structure of these products was assigned from the infrared and nuclear magnetic resonance spectra and other analytical methods.

61st Annual Meeting Ladies Events

1. Mmes. A. V. Bailey, M. F. Stansbury and L. E. Brown
2. Mmes. W. C. Dean and D. S. Therriault
3. Mmes. S. S. Chang, G. C. Cavanagh, B. Shea, J. C. Heilman, D. Pelick, J. P. Hughes, R. R. Allen, L. Boswell and F. A. Norris
4. Mmes. L. Hill, A. Bailey, W. Jacks, M. F. Stansbury
5. Mmes. R. F. Sleeter, D. S. Therriault and N. Pelick
6. Mmes. L. Hill and M. L. Kapka
7. Mmes. A. Graci and J. Foucha
8. Mrs. Frank Khym
9. Mmes. L. A. Salomon and S. S. Chang
10. Mmes. T. L. Scott and H. Hill
11. Mmes. A. V. Bailey, W. B. Jacks and M. F. Stansbury
12. Mmes. L. Bushwell and F. A. Norris
13. Mmes. F. Haurand and L. C. Cowan
14. Mmes. J. P. Hughes and R. R. Allen
15. Mmes. F. Khym, C. M. Markley and Mason Dupre
16. Ladies enjoy Continental breakfast
17. Mmes. T. H. Applewhite and A. Wood
18. Mrs. J. B. Zak
19. Mmes. C. F. Smullin, C. T. Atwood, P. Kalustian, R. Wood, D. Hagen, E. Haurand, E. Schmolka and A. Melnick
20. Mmes. H. G. Salomon and S. S. Chang

• Biochemistry and Nutrition

A PHYSICOCHEMICAL STUDY OF FAT ABSORPTION IN RATS. LIMITATION OF METHODS IN VITRO. Joan P. W. Webb, J. D. Hamilton and A. M. Dawson (St. Bartholomew's Hospital and Med. College, London, E.C.I. Great Britain). *Biochim. Biophys. Acta* 187, 42–52 (1969). The hypothesis that the first stage of normal fatty acid absorption represents a partition between a luminal bile salt mixed micellar phase and mucosal membrane lipid phase has been investigated. Everted segments of rat jejunum incubated with oleic-^{14}C acid in 10 mM sodium taurocholate accumulated a greater amount of ^{14}C-labelled free fatty acid when incubated at pH 5.8 then at pH 7.3 but this was unrelated to incorporation into jejunal ^{14}C-triglyceride. Uptake of oleic-^{14}C acid into mucosal free fatty acid from 15 mM taurocholate (20 μmoles/ml) *in vitro* was less than from 6 mM taurocholate, but the triglyceride accumulation was greater. These findings suggest that although uptake of free fatty acid by the mucosal cell *in vitro* may be predicted on the basis of a partition between micelle and lipid membrane *via* a molecular phase, this is not an important mechanism during normal fatty acid absorption.

THE FATTY ACIDS OF ADRENAL LIPIDS FROM ESSENTIAL FATTY ACID-DEFICIENT RATS. B. L. Walker (Dept. Nutr., Univ. Guelph, Guelph, Ontario). *J. Nutr.* 100, 355–60 (1970). Male rats were fed for 36 weeks diets containing 10% corn oil or 10% hydrogenated coconut oil. The adrenal lipids were extracted, fractionated by column chromatography and the fatty acid composition of the fractions determined by gas-liquid chromatography. The major fatty acid in the cholesterol ester fraction from the deficient rats was identified as 7,10,13-docosatrienoic acid ($22{:}3\omega9$) and this accounted for 25% of the total fatty acids in this fraction. The polyunsaturated acid usually found in tissues from EFA-deficient animals,

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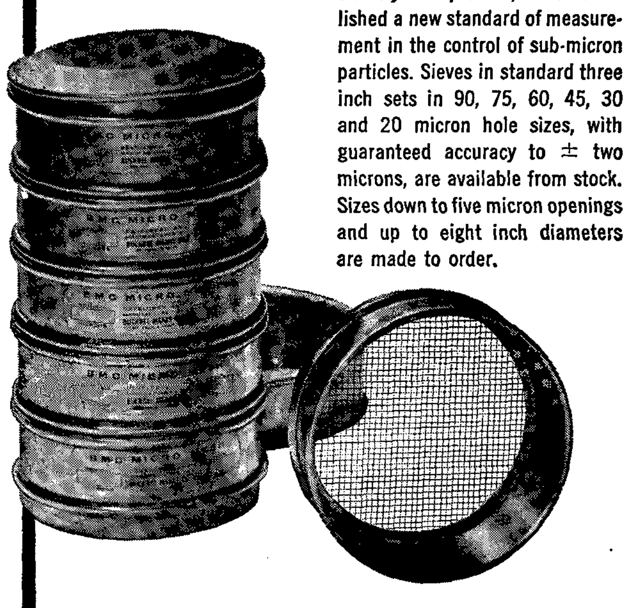
PATHWAY IN SACCHAROMYCES CEREVISIAE. M. R. Steiner and R. L. Lester (Dept. of Biochem., Coll. of Med., Univ. of Kentucky, Lexington, Ky. 40506). *Biochemistry* 9, 63–9 (1970). A particulate, cell-free preparation has been prepared from *S. cerevisiae* capable of incorporating the labeled methyl group of S-adenosyl-L-methionine, into phosphatidylcholine, phosphatidyl-M-methylethanolamine, phosphatidyl-N,N-dimethylethanolamine and ergosterol. When particles are prepared from yeast grown in the presence of choline, they have a much lower rate of labeling of phosphatidyl-N-monomethylethanolamine, phosphatidyl-N,N-dimethylethanolamine and phosphatidylcholine than particles from yeast grown in the absence of choline.

BIOSYNTHESIS OF CYCLIC DITERPENES IN EXTRACTS FROM SEEDLINGS OF RICINUS COMMUNIS L. II. CONVERSION OF GERANYLGERANYL PYROPHOSPHATE INTO DITERPENE HYDROCARBONS AND PARTIAL PURIFICATION OF THE CYCLIZATION ENZYMES. D. R. Robinson and C. A. West (Div. of Biochem., Dept. of Chem., Univ. of California, Los Angeles, Cal. 90024). *Biochemistry* 9, 80–9 (1970). Geranylgeranyl pyrophosphate serves as a precursor for the formation of the known cyclic diterpenes (+)-beyerene, (+)-sandaracopimaradiene, (−)-kaurene, and trachylobane and the cyclic diterpene casbene, for which a structure has been tentatively suggested, in cell-free extracts from seedlings of the castor bean (*R. communis* L.). Some purification of the enzymes responsible for these cyclizations was achieved by a combination of high-speed centrifugation, ammonium sulfate fractionation and chromatography on carboxymethyl-Sephadex and diethylaminoethylcellulose columns.

EFFECT OF CARNITINE ON UPTAKE, OXIDATION AND ESTERIFICATION OF PALMITATE BY THE PERFUSED RAT HEART. S. L. Rodis, P. H. D'Amato, E. Koch and G. V. Vahouny (Dept. of Biochem., Sch. of Med., George Washington Univ., Washington, D.C. 20005). *Proc. Soc. Exp. Biol. Med.* 133, 973–7 (1970). The effects of carnitine on the uptake, oxidation and esterification of circulating palmitate has been studied with the isolated perfused rat heart. At concentrations of 0.5 mM and 5.0 mM, carnitine depressed the extraction of palmitate by perfused heart throughout the 45-min perfusion period. In the presence of carnitine, there were significant increases in palmitate incorporation into mitochondrial and microsomal triglycerides, while the other cell fractions were not affected.



INFLUENCE OF ATHEROSCLEROSIS ON THE COMPOSITION, SYNTHESIS, AND ESTERIFICATION OF LIPIDS IN AORTAS OF SQUIRREL MONKEYS (SAIMIRI SCIUREUS). R. W. St. Clair, H. B. Lofland and T. B. Clarkson (Depts. Pathol. and Lab. Anim. Med., The Bowman Gray School of Med., Wake Forest Univ., Winston-Salem, N.C. USA). *J. Ather. Res.* 10, 193–206 (1969). The composition and synthesis of lipids from aortas of squirrel monkeys were studied following perfusion with acetate-1-^{14}C or mevalonate-2-^{14}C. Twenty-nine cholesterol-fed and 6 control monkeys were used. After 1 year on diet, the cholesterol-fed group had only slightly more aortic atherosclerosis than controls. Fatty acid composition of phospholipids and triglycerides was similar in both groups. Substantial differences were noted in the cholesteryl esters; the principal change was an increase in cholesteryl oleate in aortas from cholesterol-fed monkeys. In control aortas perfused with acetate-1-^{14}C phospholipid and triglyceride comprise approximately 90% of lipid radioactivity.

INFLUENCE OF VARIOUS FIBER SOURCES AND FRACTIONS ON MILK FAT PERCENTAGE. P. A. Lofgren and R. G. Warner (Dept. of Animal Sci., Cornell Univ., Ithaca, N.Y. 14850). *J. Dairy Sci.* 53, 296–304 (1970). Twenty-one Holstein cows were fed hay, corncobs, beet pulp or oat hulls as experimental crude fiber sources in a continuous feeding trial (16 weeks). Fat tests were previously depressed with a 20% mixed hay-80% pelleted concentrate ration. The test rations contained 15% crude fiber (6% from experimental source) and 14% crude protein. All diets significantly increased fat (2.3 to 3.3) ($P < 0.001$) and decreased protein (3.71 to 3.63) and solids-not-fat (8.68 to 8.57) ($P < 0.02$) percentages. Treatment differences were not significant. For cows with depressed fat tests, significant correlations were fat test change versus a) change in per cent intake of dietary crude fiber (+.49) ($P < 0.05$) and acid-detergent fiber (+.72) ($P < 0.01$), b) absolute intake of acid-detergent fiber (+0.59) ($P < 0.05$) and lignin (−0.56) ($P < 0.05$), and c) absolute digestible intake of acid-detergent fiber (+0.49) ($P < 0.05$). Acid-detergent fiber is superior to crude fiber when relating dietary fiber fractions to fat percentage. It also represents a better-defined component of feedstuffs and is easier to determine. In a second trial conducted with nonlactating cows fed the fiber sources at 150% of maintenance, little difference in acetic:propionic acid ratio was found when sampled four hours post-prandial.

THE BI-DIRECTIONAL TRANSFER OF CHOLESTEROL IN NORMAL AORTA, FATTY STREAKS AND ATHEROMATOUS PLAQUES. H. B. Lofland and T. B. Clarkson (Dept. Pathol. and Lab. Animal Med., Wake Forest Univ., Winston-Salem, N.C. 27103). *Proc. Soc. Exp. Biol. Med.* 133, 1–8 (1970). Isotopic cholesterol was administered per os for 30 days to cholesterol fed White Carneau pigeons. At weekly intervals and for 100 days after cessation of isotope administration, subgroups were killed and their aortas were divided into normal tissue, fatty streaks and atherosclerotic plaques. The results indicated that in normal aorta the influx of free cholesterol greatly exceeds that of cholesteryl esters. There appeared to be no net postive cholesterol balance. In fatty streaks, the influx of both free and esterified cholesterol was greater than for normal tissue, and influx rates exceeded those for efflux. In plaques, still greater rates of influx and efflux were seen, and the influx of cholesterol esters frequently exceeded that of free cholesterol and, like fatty streaks, plaques appeared to be in positive cholesterol balance.

STUDIES OF THE INSULIN-LIKE ACTIONS OF THIOLS UPON ISOLATED FAT CELLS. V. R. Lavis and R. H. Williams (Div. Endocrinology, Dept. of Med., Univ. of Wash., School of Med., Seattle, Wash. 98105). *J. Biol. Chem.* 245, 23–31 (1970). Insulin or one of the following compounds, L-cysteine, reduced gluthathione, 2-mercaptoethanol or dithiothreitol, was incubated with isolated fat cells or broken fat cells from rats. In concentrations greater than 10 mM, thiols suppressed lipolysis to a greater degree than did insulin, in the presence of high concentrations of epinephrine together with caffeine. These concentrations of thiols also profoundly decreased utilization of glucose by both intact and broken cells. The

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thiols, in the lower concentration range, may share with insulin a common pathway of action. In higher concentrations, the thiols apparently acted at some other site (or sites).

PROTEIN AND GLYCOLIPID COMPONENTS OF HUMAN ERYTHROCYTE MEMBRANES. J. Lenard (Div. of Endocrinology, Sloan-Kettering Inst. for Cancer Res., N.Y., N.Y., 10021). *Biochemistry* 9, 1129–32 (1970). Procedures are described by which human red cell membrane proteins completely penetrate acrylamide gels and are separated into molecular weight classes by electrophoresis in the presence of sodium dodecyl sulfate. The entire membrane is used in this procedure, without any prior extraction or fractionation. A second major carbohydrate-containing component migrated through the gel more rapidly than any of the protein bands. This material was identified as a glycolipid, and some of its chemical properties are described.

DEACYLATION OF PHOSPHOLIPIDS AND ACYLATION AND DEACYLATION OF LYSOPHOSPHOLIPIDS CONTAINING ETHANOLAMINE, CHOLINE AND β-METHYLCHOLINE BY MICROSOMES FROM HOUSEFLY LARVAE. S. S. Kumar, R. H. Millay and L. L. Bieber (Dept. Biochem., Mich. State Univ., East Lansing, Mich. 48823). *Biochemistry* 9, 754–59 (1970). A microsomal preparation (40,000–90,000 g sediment) obtained from housefly larvae converts exogenous phosphatidylcholine, phosphatidylethanolamine, and phosphatidyl-β-methylcholine into the respective glycerophosphoryl bases. Rates as high as 40 mμmoles/min per mg of protein for formation of 2-acyl-sn-glycero-3-phosphorylethanolamine and formation of 2-acyl-sn-glycero-3-phosphorylcholine from the respective di-acyl glycerophosphatides were obtained. The microsomes can be used for making preparative amounts of 2-acyl-sn-glycero-3-phosphoryl bases.

REDUCTION OF FATTY ACIDS TO ALCOHOLS BY CELL-FREE PREPARATIONS OF EUGLENA GRACILIS. P. E. Kolattukudy (Dept. Agr. Chem., Washington State Univ., Pullman, Wash.). *Biochemistry* 9, 1095–1102 (1970). Etiolated *E. gracilis* Z contained wax esters as a major lipid component and exogenous labeled acetate was readily incorporated into both the alcohol and acid moieties of the wax. The major radioactive alcohols of the wax ester were straight chain C_{15}, C_{14}, C_{16} and C_{13} in the order of decreasing amounts with detectable amounts of C_{12}, C_{17} and C_{18}. In the same order the major labeled acids of the wax ester were C_{14}, C_{13}, C_{15}, and C_{16} and C_{12} with detectable amounts of C_{18} and C_{17}. The major labeled fatty acids in the polar lipids were C_{16}, C_{14}, C_{15} and C_{18} in the order of decreasing amounts with some C_{12} and C_{17}. Enzymatic reduction of fatty acids to primary alcohols was demonstrated with a partially purified preparation from etiolated cells.

PHOSPHOLIPID CLASS AND FATTY ACID COMPOSITION OF GOLGI APPARATUS ISOLATED FROM RAT LIVER AND COMPARISON WITH OTHER CELL FRACTIONS. T. W. Keenan and D. J. Morre (Dept. of Animal Science, Purdue Univ., Lafayette, Ind.). *Biochemistry* 9, 19–25 (1970). Rough endoplasmic reticulum, Golgi apparatus and plasma membrane rich cell fractions were isolated from livers of rats under similar conditions of age and diet for analysis of phospholipid classes and fatty acid composition. Phosphatidylcholine was the major phospholipid of all membrane types. Golgi apparatus was intermediate between endoplasmic reticulum and plasma membrane with respect to levels of phosphatidylcholine and sphingomyelin. Endoplasmic reticulum was highest in phosphatidylcholine and lowest in sphingomyelin. Levels of lysophosphatidylcholine, phosphatidylserine, phosphatidylinositol, and phosphatidylethanolamine were relatively constant comparing endoplasmic reticulum, Golgi apparatus, and plasma membrane.

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COMPLETE PROGRAM
AOCS—ISF WORLD CONGRESS
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CHICAGO, ILLINOIS
SEPT. 27—OCT. 1, 1970

METHYLATION OF FATTY ACIDS IN A METHIONINE-DEPENDENT AGROBACTERIUM TUMEFACIENS CONTROLLED WITH EXOGENOUS METHIONINE. T. Kaneshiro and P. J. Thomas (Northern Res. Lab., Peoria, Ill. 61604). *Biochim. Biophys. Acta* 187, 26–35 (1969). ^{14}C-transmethylation to form the cyclopropane and branched-chain fatty acids occurred linearly without a lag if exogenous Me-^{14}C-methionine was pulsed late in the stationary growth phase. With chemostatic cultures (specific dilution rate of 0.03 h^{-1}) of a methionine-dependent *A. tumefaciens*, synthesis of only the cyclopropanes was controlled by an excess of exogenous methionine with a restricting concentration of sucrose. When exogenous methionine was a limiting growth factor, cyclopropane fatty acids were not formed and monounsaturated fatty acids accumulated to a maximal amount. A methyl-branched fatty acid presumed to be ^{14}C-methylstearic acid (Me-C_{18}) was also found when excess methionine was present in batch cultures with low aeration. In addition to the specific ^{14}C-methylation, the "methylstearic" acid was identical in its gas-liquid chromatographic property to a reference Me-C_{18} compound. The reference Me-C_{18} was prepared from the PtO_2-hydrogenation of C_{19} cyclopropane acid (dihydrosterculic). Since the "methylstearic" acid was detected in aged cells of static cultures, a biological transmethylation-hydrogenation was suggested.

INFLUENCE OF LACTOSE FEEDING ON CHOLESTEROL ABSORPTION AND METABOLISM. N. Iritani and N. Takeuchi (Tezukayama-Gaukin College and 3rd Dept. of Int. Med., Osaka Univ. Hosp., Osaka, Japan). *J. Atheroscler. Res.* 10, 207–16 (1969). Cholesterol-4-^{14}C was injected intravenously in rats fed on cholesterol-enriched lactose, sucrose and stock diets. It was metabolized and excreted into the bile faster in the control cholesterol-fed group than in the two sugar-supplemented groups; in the sucrose group faster than in the lactose group. In the control group, the specific activity of cholesterol was high in the small intestine soon after oral administration of cholesterol-4-^{14}C, but it remained low in the plasma and liver. Conversely, it was low in the small intestine but high in the plasma and liver in the lactose group. Although the uptake of cholesterol was much greater in the intestinal wall in the control group, it did not appear to be transported easily into the plasma: the converse applied in the lactose group. The marked hypercholesteraemia induced by the lactose-cholesterol diet might be due to described cholesterol metabolism and increased cholesterol absorption and transport from the intestine.

DEPRESSION OF MYOCARDIAL CONTRACTILITY IN RATS BY FREE FATTY ACIDS DURING HYPOXIA. A. H. Henderson, A. S. Most, W. W. Parmley, R. Gorlin and E. H. Sonnenblick (Cardiovas. Div., Peter Bent Brigham Hosp., and Harvard Med. School, Boston, Mass. 02115). *Circulation Res.* 26, 439–49 (1970). Rat papillary muscles were used to study the influence of glucose (5 mM), linoleate (1 to 1.75 mM), octanoate (0.5 to 1.75 mM) and pent-4-enoic acid (1 to 5 mM) on mechanical performance under oxygenated, hypoxic and anoxic conditions. The buffer solution contained 0.3 mM albumin. Free fatty acids (FFA) (1.0 to 1.75 mM) did not alter mechanical performance under oxygenated conditions. During hypoxia or anoxia, FFA (0.5 to 1.75 mM) depressed contractility and increased resting force; glucose improved mechanical performance and modified the depressant effects of FFA. The depressant effect of the nonmetabolized FFA, pentenoic acid, was similar to that of other FFA. This suggests that the effect was mediated directly by FFA or acyl CoA derivatives rather than their metabolic products, and that it might be due to a detergent effect or calcium binding by FFA present in excess of intracellular FFA binding capacity at low pH. Force development during anoxia could be augmented by calcium, implying that the reduced ability of the myofilaments to contract could not be attributed entirely to a reduction of high energy stores.

EFFECTS OF GLUCAGON AND INSULIN ON PLASMA FREE FATTY ACIDS AND BLOOD SUGAR IN OWLS. F. Grande (Jay Phillips Res. Lab., Mt. Sinai Hosp. and Lab. of Physiological Hygiene, Univ. of Minn., Minneapolis, Minn. 55404). *Proc. Soc. Exp. Biol. Med.* 133, 540 (1970). Intravenous injection of crystalline glucagon (50.0 μg/kg) of mammalian origin in owls caused significant elevations of plasma FFA and BS, results similar to those observed in other avian species. Intravenous

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injection of crystalline beef insulin (2.0 U/kg) in owls caused marked hypoglycemia, but no significant change of plasma FFA concentration.

PERSISTENCE OF LIPOLYSIS IN FROZEN ADIPOSE TISSUE. K. G. Geyer and H. M. Goodman (Dept. of Physiol., Harvard Med. School, Boston, Mass. 02115). *Proc. Soc. Exp. Biol. Med.* 133, 404–09 (1970). In studying the regulation of lipolysis in adipose tissue, it is often necessary to postpone the chemical analyses of tissue and incubation medium for some time after the termination of the experiment. For this purpose, we have stored such tissue and media in a freezer at −8C. It was soon observed, however, that experiments in which samples were frozen for more than a day or two prior to analysis gave particularly high values for both fatty acids (FFA) and glycerol. For the past few years, therefore, we have routinely boiled the adipose tissue segments prior to freezing, and have thereby obviated the problem. The present report documents these findings.

PLASMA AND TISSUE CHOLESTEROL AND LIPID LEVELS IN RABBITS ON L-HISTIDINE-SUPPLEMENTED DIETS. R. L. Geison and H. A. Waisman (J. P. Kennedy Jr. Labs., Dept. of Pediatrics, Univ. of Wisc. Med. Center, Madison, Wisc. 53706). *Proc. Soc. Exp. Biol. Med.* 133, 234–37 (1970). Feeding 5 and 8% excess L-histidine to rabbits caused significantly elevated plasma cholesterol levels. Phospholipid levels were slightly but not significantly elevated. The 5% histidine-supplemented diet produced plasma levels of 20–50 mg/100 ml of histidine. After 17 weeks on diets no effects on brain cerebrum and cerebellum or liver cholesterol concentrations were found. Brain and liver total lipid and phospholipid and cerebrum galactolipid concentrations were also normal. The effect of excess dietary histidine on lipid components is apparently localized in the circulatory system. The effects noted in rabbits are much less than those previously observed in monkeys.

EFFECT OF INHIBITORS OF CHOLESTEROL BIOSYNTHESIS ON YEAST GROWTH. D. G. Gallo and W. A. Zygmunt (Mead Johnson Res. Cen., Evansville, Ind. 47721). *Proc. Soc. Exp. Biol. Med.* 133, 862–4 (1970). No correlation was found between the ability of compounds to inhibit cholesterol synthesis by rat liver homogenates and their inhibiting effect on the growth of yeasts.

SERUM CONCENTRATIONS OF LIPIDS IN RABBITS INFECTED WITH ESCHERICHIA COLI AND STAPHYLOCOCCUS AUREUS. J. I. Gallin, W. M. O'Leary and D. Kaye (Depts. of Med. and Microbiol., New York Hosp.-Cornell Med. Center, New York, N.Y.). *Proc. Soc. Exp. Biol. Med.* 133, 309–13 (1970). Rabbits infected subcutaneously with *E. coli* developed hyperlipemia related to increased serum levels of free fatty acids early in the infection and later to increased levels of triglycerides. Rabbits challenged subcutaneously with *S. aureus* had normal levels of serum lipids during the acute febrile period but after 24 hrs. developed hyperlipemia related to hypertriglyceridemia.

SUPPRESSION OF ANTIBODY-FORMING CELLS TO SERRATIA MARCESCENS LIPOPOLYSACCHARIDE AFTER A LARGE DOSE OF ANTIGEN. C. Field, J. L. Allen, and H. Friedman (Dept. of Microbiol., Temple Univ. School of Med. and Albert Einstein Med. Center, Philadelphia, Pa.). *Proc. Soc. Exp. Biol. Med.* 133, 463–68 (1970). The number of specific antibody plaque-forming cells appearing in spleens of mice immunized with various concentrations of the lipopolysaccharide somatic antigen derived from *Serratia marcescens* was studied in detail. Maximum numbers of antibody-forming cells appeared 4–5 days after intraperitoneal injection of 50 μg of antigen. Fewer plaque-forming cells appeared in spleens of mice treated with a lower concentration of antigen. Furthermore, mice injected with 500 μg of the lipopolysaccharide also had relatively few plaque-forming cells, indicative of a marked depression of the immune response. The "nonspecific" response to sheep erythrocytes was enhanced in spleens of mice injected with the highest concentrations of antigen, as compared to animals receiving smaller amounts. The specificity of the antibody-plaque response was readily demonstrated by inhibition experiments using either specific antigen or anti-mouse globulin in the test agar plates. Plaques were inhibited when 10–100 μg of *Serratia* lipopolysaccharide, but not *Salmonella* or *E. coli* antigen, was incorporated into the agar.

INCORPORATION OF ACETATE-1-^{14}C INTO THE FATTY ACIDS OF THE DEVELOPING RAT BRAIN. G. A. Dhopeshwarkar, R. Maier and J. F. Mead (Lab. of Nuclear Med. and Radiation Biol., Univ. Calif., Los Angeles, Calif. 90024). *Biochim. Biophys. Acta* 187, 6–12 (1969). In order to gain information about passage of fatty acids from blood to the brain in weanling and adult rats, it was necessary to determine the pattern of fatty acid synthesis from acetate-1-^{14}C. The uptake of intraperitoneally administered acetate-1-^{14}C was high in the brain but low in the liver of weanling rats. The reverse was noted in the adult animals. A decrease in the palmitate to stearate ratio and an increase in the oleate to stearate ratio was found in older brains. Weanling rat liver, unlike the adult liver, was very rich in docosahexaenoic acid. Palmitic acid, both from liver and brain, irrespective of age, had the highest specific activity. A drop in the specific activity of fatty acids with increasing chain length from palmitic to docosahexaenoic was more pronounced in the brains of the young animals. The distribution of ^{14}C among the carbons of palmitic acid confirmed its synthesis by the *de novo* synthetic process except in the case of the weanling livers. With increasing chain length, the chain elongation process contributed most of the ^{14}C incorporation. The chain elongation process, with respect to stearate and oleate, seemed to be more pronounced in the adult brain than in the weanling rats. However, the opposite seems to be true in the liver.

SEX DIFFERENCES IN THE METABOLISM OF FATTY ACIDS IN VITRO. Kirsten Christiansen, Minerva V. Gan and R. T. Holman (Univ. of Minn., The Hormel Inst., Austin, Minn. 55912). *Biochim. Biophys. Acta* 187, 19–25 (1969). The influence of sex on the chain elongation, dehydrogenation and incorporation of fatty acids has been studied using a microsomal system. A significant sex difference was found in the elongation of palmitic acid to stearic acid. Female rats performed the elongation with a capacity about twice as high as that of male rats. No sex difference was detected in the ability to perform the dehydrogenation and chain-elongation steps leading from linoleic acid to arachidonic acid. The incorporation of arachidonic acid into complex lipids was not influenced by the sex.

α-HYDROXY FATTY ACIDS IN HEREDITARY ATAXIC POLYNEURITIS (REFSUM'S DISEASE). J. P. Blass, J. Avigan and D. Steinberg (Lab. of Metabolism, Nat. Heart Inst., Nat. Inst. of Health, Bethesda, Md. 20014). *Biochim. Biophys. Acta* 187, 36–41 (1969). In the skin from two patients with hereditary ataxic polyneuritis, the composition of long, straight chain α-hydroxy fatty acids was normal, and the concentration of these acids was at the lower limit of the range in six control subjects. The content and composition of hydroxy fatty acids in myelin from the brains of young rats fed a high phytol diet was normal, although phytanic acid represented 2.8% of the myelin fatty acids. These results do not support previous suggestions that the symptoms in hereditary ataxic polyneuritis are due to a deficiency in straight chain α-hydroxy fatty acids.

GLYCOLIPID BIOSYNTHESIS: BIOSYNTHESIS OF MANNOSE- AND FUCOSE-CONTAINING GLYCOLIPIDS BY HELA CELLS. H. B. Bosmann (Dept. of Pharmacol. Univ. of Rochester Med. School, Rochester, N.Y. 14620). *Biochim. Biophys. Acta* 187, 122–32 (1969). Triton X-100 extracts of HeLa cells incorporated both ^{14}C-fucose and ^{14}C-mannose into endogenous glycolipid acceptors using GDP-^{14}C-fucose or GDP-^{14}C-mannose as substrates. Both systems had an optimum temperature of 37C and required Mg^{2+}. Silicic acid-impregnated paper chromatography of the reaction products indicated that with each sugar a distinct glycolipid was synthesized. The ^{14}C-fucose system exhibited a K_m of 1.9 μM with respect to GDP-fucose, and the ^{14}C-mannose system had a K_m of 3.5 μM with respect to GDP-mannose. Using acetone precipitation it was possible to dissociate the enzyme and acceptor for each system. In each example the glycolipids synthesized were identified as glyco-glycerolipids and not sphingolipids or phospholipids. Diolein acted as an exogenous acceptor in the mannose system, while dipalmitin acted as an acceptor for the fucose system; distearin did not act as an acceptor for either sugar.

SOME OBSERVATIONS OF THE SEDIMENTATION OF CHICKEN HEART GLYCERALDEHYDE 3-PHOSPHATE DEHYDROGENASE. K. C. Aune and S. N. Timasheff (Grad. Dept. Biochem., Brandeis Univ., Waltham, Mass. 02154). *Biochemistry* 9, 1481–84 (1970). In dilute salt solutions glyceraldehyde 3-phosphate dehydrogenase from chicken heart has a molecular weight of 137,600 as determined by the method of sedimentation equilibrium. In a solution of 1.3 M potassium phosphate, the protein exhibits an apparent molecular weight of 86,200 by the same

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method. The determination of the sedimentation coefficient of the protein as a function of phosphate concentration and the analysis of the dependence led to the conclusion that positive preferential hydration is responsible for the decrease in measured apparent molecular weights in these solutions rather than a dissociation of the tetramer to subunits.

Fasting plasma cholesteryl esters in diabetic children consuming corn oil. E. C. Albutt and G. W. Chance (Univ. of Birmingham Inst. of Child Health, Francis Road, Birmingham 16, Eng.). *Am. J. Clin. Nutr.* 22, 1552–54 (1969). The fatty acid composition of the fasting plasma cholesteryl ester fraction was determined in samples obtained from children with diabetes mellitus who have been consuming corn oil and corn oil products in their diets since diagnosis 4–7 years ago. These results have been compared with those obtained from diabetic children consuming a standard diabetic diet and from normal children. The percentage of cholesteryl esters as cholesteryl linoleate was maximal at 76% when adipose tissue linoleic acid was 30%. Cholesteryl linoleate appeared to increase mainly at the expense of cholesteryl oleate.

Process for the production of beta carotene. R. C. Bohinski (Chas. Pfizer & Co.). *U.S. 3,492,202.* The yields of beta carotene produced by the aerobic cultivation of *Blakeslea trispora* in aqueous nutrient media containing naturally occurring fats or oils are improved by replacing all or part of the oil or fat by a soapstock obtained from the purification of a naturally occurring fat or oil.

Nutritional contribution of volatile fatty acids from the cecum of rats. M. G. Yang, K. Manoharan and O. Mickelsen (Foods and Nutr. Dept., Michigan State Univ., East Lansing, Mich. 48823). *J. Nutr.* **100**, 545–50 (1970). The contribution of cecal acetic, propionic and butyric acids to rats' energy metabolism amounted to 4.7% of the caloric intake. This was determined by measuring rates of disappearance of these volatile fatty acids (VFA) from the cecum of rats killed at various intervals after the last meal. Further support indicating that VFA are energy sources for rats came from the appearance of $^{14}CO_2$ in the breath when radioactive VFA were placed in their cecum.

Studies on adrenal cortical cytochrome P-450. IV. Effects of carbon monoxide and light on cholesterol side chain cleavage. L. D. Wilson and B. W. Harding (Dept. Medicine, Univ. Southern California, Los Angeles). *Biochemistry* **9**, 1621–25 (1970). The oxidative cleavage of the side chain of cholesterol has been studied in extracts of acetone powders prepared from bovine adrenocortical mitochondria. Some of the properties of these powders are described and it is found that side chain cleavage is 50% inhibited with a $CO:O_2$ ratio of about 1 and that light at 450 mμ is best able to reverse this inhibition. However, no evidence of peaks in addition to that at 450 mμ in the action spectrum could be demonstrated. By using intermittent illumination and assuming a quantum yield of unity, the absolute absorption coefficient at 450 mμ has been determined ($\beta_{450} = 3.9 \times 10^6$ cm^2/mole of heme). The absolute absorption spectrum of the CO-inhibited component (P-450) from 400 to 490 mμ has been calculated. Comparison of these results with those found for 11β hydroxylation suggests that a different P-450 is used for each of these reactions.

Phosphatidic acid and phosphatidylinositol metabolism in Schizosaccharomyces pombe. G. L. White and J. N. Hawthorne (Dept. Biochem., Univ. of Birmingham, P.O. Box 363, Birmingham, 15, U.K.). *Biochem. J.* **117**, 203–13 (1970). The phospholipid composition of *Schizosaccharomyces pombe* was not markedly affected by changes in the phosphate concentration of the medium or phase of growth. The major fatty acids in the total lipid extract and purified phosphatidylinositol were palmitic acid and oleic acid. Phosphatidic acid was synthesized by acylation of L-3-glycerophosphate in *Schiz. pombe* and phosphatidate phosphohydrolase was present. Phosphatidylinositol synthesis from inositol occurred in the absence of CDP-diglyceride. Even with dialyzed cell-free preparations, the inositol lipid was synthesized by an apparently energy-independent route, at rates greater than would be required during cell growth. Phosphatidylinositol appeared to be broken down by a phospholipase D. All the enzymes examined were particulate; similar activties were found in *Saccharomyces cerevisiae.*

Studies on vitamin E action: peroxidation inhibition in structural protein-lipid micelle complexes derived from rat liver microsomal membranes. H. M. Tinverg and A. A. Barber (Dept. of Zool., Univ. of Calif., Los Angeles, Calif. 90024). *J. Nutr.* **100**, 413–18 (1970). Vitamin E and butylated hydroxyanisole (BHA) inhibit lipid peroxidation in microsomal suspensions and in a test system consisting of microsomal structural protein and lipid micelles. A common inhibitory mechanism is suggested by the similarity of the two systems in their response to the two inhibitors. Gas-liquid chromatography was used to demonstrate that peroxidation in the complex was accompanied by decreases in oleic and linoleic acids and by complete disappearance of arachidonic acid. The structural protein used in these experiments bound vitamin E but not the synthetic antioxidant, suggesting that the binding may involve the hydrocarbon chain of vitamin E. This association may be hydrophobic in nature. Vitamin E inhibition of peroxidation in the complex is correlated with the amount of the antioxidant bound, whereas inhibition by butylated hydroxyanisole is not. A possible difference in the physiological action of vitamin E and BHA was suggested on the basis of these binding differences.

Steroid metabolism in the rabbit. W. Taylor (Dept. of Physiology, The Med. School, Univ. of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU, U.K.). *Biochem. J.* **117**, 263–65 (1970). Cortisone-4-^{14}C was administered to anaesthetized male and female New Zealand White rabbits as a single injection or as 45–60 min infusion. The method of administration of the steroid did not significantly affect the total excretion of radioactivity in bile and urine (83.8 ± 10.8% (S.D.)). The mean ratio of metabolites in urine to those in bile was 0.97 ± 0.23% (range 0.6401.3). When bile and urine samples were hydrolyzed successively by β-glucuronidase, cold acid and hot acid, neutral metabolites extracted by ethyl acetate-ether were found mainly after hydrolysis by β-glucuronidase. An approximately equal proportion of the dose was converted into substances not extractable from alkaline aqueous solution after hydrolysis.

Co-ordination between membrane phospholipid synthesis and accelerated biosynthesis of cytoplasmic ribonucleic acid and protein. J. R. Tata (National Inst. for Med. Res., Mill Hill, London, N.W. 7, U.K.). *Biochem. J.* **116**, 617–30 (1970). The rate of synthesis of membrane phospholipid was studied in rat liver and seminal vesicles by following the incorporation of orthophosphate-^{32}P, choline-^{14}C and glycerol-^{14}C. Particular emphasis was laid on the endoplasmic reticulum, which was fractionated into smooth microsomal membranes, heavy rough membranes, light rough membranes and free polyribosomes. Phospholipid labelling patterns suggested a heterogeneity in the synthesis and turnover of the different lipid moieties of smooth and rough endoplasmic membranes. The major phospholipids, phosphatidylcholine and phosphatidylethanolamine, were labelled relatively rapidly with ^{32}P over a short period of time whereas incorporation of radioisotope into the minor phospholipids, sphingomyelin, lysolecithin and phosphatidylinositol proceeded slowly but over a longer period of time. It is concluded that there is some mechanism in the cell that tightly co-ordinates the formation of membranes, especially those of the endoplasmic reticulum, when an increased demand is made for protein synthesis.

Degradation of insulin by a particulate fraction from adipose tissue. K. Sumner and R. J. Doisy (Dept. Biochem., Upstate Med. Center, Syracuse, N.Y. 13210). *Biochem. J.* **116**, 825–31 (1970). The destruction of ^{125}I-labelled insulin by an enzyme system from rat adipose tissue was studied. The system was located in the particulate fraction. Activity was assayed by the amount of ^{125}I-labelled degradation products rendered soluble in trichloroacetic acid. The system was heat-labile, with an alkaline pH optimum. The velocity of the reaction varied directly with the enzyme concentration.

Enzymic synthesis of 0-alkyl bonds in glycerolipids. F. Snyder, B. Malone and M. L. Blank (Med. Div., Oak Ridge Assoc. Univs., Oak Ridge, Tenn. 37830). *J. Biol. Chem.* **245**, 1790–99 (1970). We have found that 0-alkyl bonds in glycerolipids are synthesized by microsomal enzymes of preputial gland tumors when dihydroxyacetone-P or glyceraldehyde-3-P and 1-^{14}C long chain fatty alcohols are used in substrates; ATP, coenzyme A, and Mg^{++} are essential cofactors. The 0-alkyl moieties formed from the 1-^{14}C- and 9,10-^{3}H-labeled long chain fatty alcohols show that the fatty alcohol chains are directly incorporated. Dihydroxyacetone-P is an obligate source of the glycerol portion of glyceryl ethers, since only the dihydroxyacetone-P served as a precursor when 1-hydroxy-3-chloro-2-propane phosphate was used as a specific inhibitor of

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triose-P isomerase, which is present in the microsomal preparation.

THE BIOCLEAVAGE OF ALKYL GLYCERYL ETHERS IN MORRIS HEPATOMAS AND OTHER TRANSPLANTABLE NEOPLASMS. J. F. Soodsma, C. Piantaodsi and F. Snyder (Med. Div., Oak Ridge Univ., Oak Ridge, 37830). *Cancer Res.* 30, 309–11 (1970). This study compares the ether-cleaving ability of normal rat liver homogenate with various transplantable tumor homogenates. The results show that the cleavage system is the most active in normal rat liver and Morris Hepatoma 7794A, much less active in Hepatoma 7777 and very low or absent in the other tumors tested. These data demonstrate that neoplasms that contain high levels of 0-alkyl-diacylglycerols do not have an active alkyl ether cleavage system.

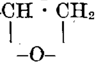
REDUCTION OF SERUM CHOLESTEROL AND TRIGLYCERIDE LEVELS BY THE COMBINED ADMINISTRATION OF NEOMYCIN AND CLOFIBRATE. P. Samuel, C. M. Holtzman, E. Meilman and I. Sekowski (Dept. Medicine, Long Island Jewish Medical Center, New Hyde Park, New York). *Circulation* 41, 109–114 (1970). The combined oral administration of neomycin (2 g daily) and clofibrate (2 g daily) reduced significantly serum cholesterol levels in 15 of 16 patients. Most of these patients had type II hypercholesterolemia and clinical evidence of arteriosclerosis. The combined regimen of the two drugs was more effective in reducing cholesterol levels in about one third of the patients than administration of either one of these drugs alone. The average decrease of serum cholesterol in these patients while on the combined regimen was 38% from the control values. Control serum triglyceride levels were normal in most patients, thus the effect of the drugs on triglycerides was moderate. No noteworthy side effects were encountered. It is felt that a trial of treatment by the combined administration of neomycin and clofibrate is justified in patients with type II hypercholesterolemia and arteriosclerosis who are resistant to other forms of treatment or to treatment by a single drug.

• Detergents

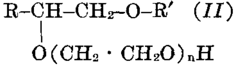
ARSENIC IN DETERGENTS: POSSIBLE DANGER AND POLLUTION HAZARD. E. E. Angino, L. M. Magnuson, T. C. Waugh, O. K. Galle and J. Bredfeldt (State Geol. Survey of Kan. and Dept. Civil Eng., Univ. Kan., Lawrence 66044). *Science* 168, 389–90 (1970). Arsenic at a concentration of 10 to 70 parts per million has been detected in several common presoaks and household detergents. Arsenic values of 2 to 8 parts per billion have been measured in the Kansas River. These concentrations are close to the maximum amount (10 parts per billion) recommended by the United States Public Health Service as a drinking-water standard.

REACTIVE SURFACTANTS. II. SYNTHESIS AND PROPERTIES OF N-TRIMETHYLAMINOALKANIMIDES. Eiichi Kameyama, Yutaka Minegishi and Tsunehiko Kuwamura (Gumma Univ., Kiryu, Gumma-ken, Japan). *Yukagaku* 18, 897–900 (1969). Some higher homologs of *N*-trimethylaminoalkanimides (*I*), $(CH_3)_3NNCOR$, R being C_{11}–C_{17}, were prepared from fatty acid hydrazides. Aqueous solutions of *I* were neutral and showed very low conductivities. The behavior of *I* in aqueous solutions was generally similar to that of nonionic surfactants and *N*-acyldimethylaminoacetimides (*II*), $R(CH_3)_2NNCOCH_3$. The surface tension of *I* above critical micelle concentration was about 30 dyne/cm, a little lower than that of the corresponding *II*. The critical micelle concentration of *I* was slightly higher than that of *II*. Cotton clothes treated with stearoyl homolog of *I* showed excellent durable water-repellency. *I* was examined for interfacial tension, penetrating power, and foaming power in comparison with polyoxyethylene nonionic surfactants.

SYNTHESIS AND PROPERTIES OF NEW-TYPE NONIONIC SURFACTANTS FROM 1,2-EPOXYALKANES. Saburo Komori, Mitsuo Komatsu and Iaso Ikeda (Osaka Univ., Osaka, Japan). *Yukagaku* 18, 901–8 (1969). 1,2-Epoxyalkanes, $\underset{\text{—O—}}{RCH \cdot CH_2}$ with 4–10 C atoms, were made to react with alcohols, R′OH, with a similar number of C atoms, to form ether alcohols, $R \cdot CH(OH) \cdot CH_2 \cdot OR'$ (*I*). Ethylene oxide was added to *I* to form new-type nonionic surfactants of the general formula, $R{-}CH(O(CH_2 \cdot CH_2O)_nH){-}CH_2{-}O{-}R'$ (*II*). The compounds *II* with R and R′ with 10 or 12 C atoms were better penetrants than Aerosols. They were less foaming.



$$\underset{\text{—O—}}{RCH \cdot CH_2}$$



$$R{-}\underset{\displaystyle O(CH_2 \cdot CH_2O)_nH}{\underset{|}{C}H}{-}CH_2{-}O{-}R'$$

61st Annual Meeting Technical Sessions →

1. A. V. Graci
H. K. Gardner
P. H. Eaves
F. Passalaqua
2. E. I. Marshack
Norma Lee Phillips
A. R. Baldwin
3. M. G. Kokatnor
S. Koritala
Kak-Yuen Tau
4. G. G. Wilson
D. R. Kime
5. J. Crafton
B. Walker
R. E. Richenberg
6. N. Gilliam
R. Sherwin
T. Potts
7. J. L. Van Haften
R. M. Rice
8. W. T. Coleman
P. A. Williams
9. F. Bradley
R. Reiser
10. J. L. White
J. P. Hughes
11. J. F. Georgal
W. C. Powe
R. W. Poe
12. J. Crafton
D. L. McPherson
C. Meierhoefer
13. B. W. Minshew
S. Smith
R. T. Sleeter
14. J. K. Punwar
M. G. Kokatnur
H. N. Bhagavan
P. R. Sunaresan
15. T. J. Weiss
F. A. Norris
R. T. Buswell
16. C. T. Atwood
D. Jackson
F. B. White
17. G. E. Sadek
C. H. Haurand
F. J. Birkhaug
18. E. S. Pattison
H. C. Black
J. C. Cowan
19. R. G. Simon
A. N. Siakotos
20. I. A. Wolff
Dan Swern
21. R. L. Voit
R. Bednarski
J. Goodwin
A. Scroggins
D. Tanner
22. F. Bradley
R. Christensen
W. O. Lundberg
23. M. D. Barker
J. G. Hamilton
J. R. Paulsrud
R. C. Reitz
24. C. A. Gibson
B. R. Zeitlin
I. A. Wolff
J. W. Harlan
D. Swern
F. R. Earle
25. T. J. Weiss
C. W. Stahle
26. L. Goldblatt
L. C. Berardi
27. F. A. Norris
N. T. Joyner
28. F. Bradley
R. O. Feuge
29. D. Melnick
W. A. Parker
30. J. C. Cowan
E. Christensen
31. W. C. Dean
M. A. Clark
E. Hahn
D. L. Henry

PREPARATION OF CATIONIC SURFACTANTS FROM SEC-CHLOROALKANES AND ALKANOLAMINES. Osamu Kawabata, Tsutomu Takeda, Hisatake Kato and Saburo Komori (Shin-Nitto Chem. Co., Amagasaki, Hyogo-ken, Japan). *Yukagaku* 18, 891–6 (1969). It was found that *N*-β-oxyethyl-2-aminoalkanes (*I*) could be prepared quite easily by a new one-step process. Chloroalkanes are insoluble in alkanolamines, but they reacted easily under vigorous agitation by a homomixer. *I* were obtained in high yields at 1 atm., 150–160C and without catalyst or solvent.

WETTABILITY OF SOLID SURFACES. Teruo Tsunoda (Hitachi Central Res. Lab., Kokubunji, Tokyo, Japan). *Yukagaku* 18, 839–48 (1969). Topics reviewed include the methods for measuring wettability, wetting of low-energy surfaces (i.e. natural and synthesized polymers), and wetting of high-energy surfaces (i.e. metals), critical surface tension, wetting by solution, and adsorbed films and wetting.

X-RAY DIFFRACTOMETRIC STUDIES OF COMMERCIAL TRANSPARENT SOAPS. Hironobu Kamota, Yoshihiro Ohata, Kazuo Aoki and

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Tetsuo Nishina (Shiseido Co., Kamiyacho, Kita-ku, Tokyo, Japan). *Yukagaku* 18, 804–8 (1969). The structure of commercial transparent soaps is not completely amorphous, but consists essentially of a finer crystalline structure than ordinary opaque soaps. In spite of different manufacturing processes and constituents, both the framed and milled transparent soaps are quite similar in the mechanism by which they become transparent.

Applications of surfactants to the construction of asphaltic roads. Kenzo Inagaki (Doro Ind. Co., Minami-ku, Yokohama, Japan). *Yukagaku* 18, 566–73 (1969). Topics reviewed include agents for preventing the exfoliation of asphalt, emulsifiers for asphalt and processing methods for asphalt emulsions.

Application of surfactants in foods. Kimio Terada and Hiroshige Kono (Asahi Electrochem. Co., Nihonbashi, Chuo-ku, Tokyo, Japan). *Yukagaku* 18, 543–56 (1969). A review with 143 references. Surfactants are used as emulsifiers (margarine, soft cheese, fish sausage, etc.), defrothing agents (condensed milk, tofu, etc.), wetting and dispersing agents (chocolate, chewing gum, etc.).

Application of surfactants in cosmetic industries. Takeo Mitsui (Shiseido Co., Nippacho, Kohoku-ku, Yokohama, Japan). *Yukagaku* 18, 521–9 (1969). Surfactants used in cosmetic industries are emulsifiers (cream and emulsions), solubilizers (lotions and men's hair lotions) and dispersing agents (cosmetics of make-up). These surfactants should be constant in properties, free from irritating and toxic substances and low in odor and color.

Application of surfactants for flotation. Taro Yamasaki (Tohoku Univ., Sendai, Japan). *Yukagaku* 18, 417–26 (1969). Some agents used in flotation are surfactants. For example Na oleate, Na alkylsulfates, Na alkylsulfonates, cetyltrimethylammonium acetate and cetylpyridinium chloride are used as collectors.

Application of surfactants in pharmaceuticals. Kazumaro Furuse (Eisai Co., Koishikawa, Bunkyo-ku, Tokyo, Japan). *Yukagaku* 18, 530–42 (1969). Surfactants are used as main (bactericidal, spermatozocidal, and constipation-treating) and auxiliary pharmaceuticals (solubilizing the fat-soluble vitamins and the corticosteroids, accelerating the destruction of tablets, etc.). Toxicity should be checked.

Surfactants and emulsion polymerization. Takuhiko Motoyama (High Polymer Chem. Ind., Kita-ku, Osaka, Japan). *Yukagaku* 18, 574–81 (1969). Positive and negative effects of surfactants were described in relation to the mechanism of emulsion polymerization from a colloid-chemical standpoint.

Application of surfactants in pesticidal formulations. Seizo Matsumoto (Japan Agr. Chem. Co., Nihonbashi, Chuo-ku, Tokyo, Japan). *Yukagaku* 18, 557–65 (1969). The use of surfactants in agricultural chemists is reviewed. The principal uses are in emulsifiable concentrates (emulsions) and wettable powders (suspensions). The importance of hydrophile-lipophile balance, wettability and toxicity of pesticidal formulations containing surfactants is discussed.

Environmental sanitation and detergents. Shinichi Tomiyama (Lion Fat and Oil Co., Sumida-ku, Tokyo, Japan). *Yukagaku* 18, 427–42 (1969). A review with 244 references most of which are from Japanese journals. Topics discussed include the effects of detergents to improve environmental sanitation (foods, food utensils, human bodies, kitchens, factories, clothes, etc.) and biochemical problems of detergents (detrimental effects of bubbles in water, alleged toxicity of detergents).

Application of surfactants for paints, printing inks, and pigments. Sigeru Koso (Nippon Oils & Fats Co., Higashi-Yodogawa-ku, Osaka). *Yukagaku* 18, 620–7 (1969). Topics discussed include dispersion of pigments, formation of paint film and emulsion paints.

Application of surfactants for cutting and grinding agents of metals. Kenichi Goto (Nihon Univ., Narashino, Chiba-ken, Japan). *Yukagaku* 18, 604–13 (1969). Cutting and grinding oils are widely used for metal processing. The role of surfactants is reviewed.

Application of surfactants in photographic materials. Ken'ichi Koda (Konishiroku Photogr. Ind. Co., Hino, Tokyo, Japan). *Yukagaku* 18, 582–7 (1969). Topics reviewed include the effect on the growth of crystals of photographic emulsion particles, the interaction of photographic emulsions and anionic surfactants and surfactants for various other purposes.

Oil dispersers. Goro Kondo and Shigeru Honda (Government Ind. Res. Inst., Ikeda, Osaka, Japan). *Yukagaku* 18, 673–7 (1969). The use of surfactants to disperse petroleum oil thrown out from oil tankers on the sea by accident is discussed.

Application of surfactants for fire extinguishing agents. Makoto Hoshino and Rokuro Nii (Fire Res. Inst., Mitaka, Tokyo, Japan). *Yukagaku* 18, 685–9 (1969). Extinguishing agents are reviewed for fires fueled by liquids (petroleum, alcohol, etc.) and by solids.

Application of surfactants for metal extraction. Hiroshi Fukutomi (Tokyo Inst. Technol., Meguro-ku, Tokyo). *Yukagaku* 18, 655–67 (1969). The main theme is solvent extraction of U with anionic and cationic surfactants.

Surface modifications of synthetic polymers with surface active agents. Hideo Marumo (Lion Fat & Oil Co., Edogawa-ku, Tokyo, Japan). *Yukagaku* 18, 639–48 (1969). Topics reviewed include the surface of synthetic polymers (*I*), critical surface tension of *I*, washing and wet soiling, and adhesion of plastics.

Application of surfactants for dyeing industries. Yoshio Nemoto (Municipal Ind. Res. Inst., Nagoya, Japan). *Yukagaku* 18, 614–19 (1969). The topics reviewed include the application of surfactants based on surface activity and affinity to fibers and dyes and the behavior of surfactants as dyeing aids.

Application of surfactants in concrete. Mamoru Katsumi (Kao Soap Co., Wakayama, Japan). *Yukagaku* 18, 628–38 (1969). The chemical composition and hardening mechanism of cement, effect of dispersing agents, and the AE agents (i.e. one of mixing agents used for uniform distribution of minute air bubbles in concrete) are reviewed.

High-expansion foams for fire fighting. Minoru Umezu (Resource Res. Inst., Ukima, Kita-ku, Tokyo, Japan). *Yukagaku* 18, 678–84 (1969). The topics covered in this review include the mechanism of foaming, various factors affecting foaming, the fluidity of foams, foaming agents (ammonium lauryl sulfate, amino fatty acids, alkyl aryl sulfonates, alkyl phenols, alkylated esters, alkylated phenol ethers, etc.), the effects on fire extinguishing and practical applications.

Application of surfactants in petroleum products. Harumichi Watanabe (Nippon Oil Co., Kawasaki, Japan). *Yukagaku* 18, 588–603 (1969). The topics covered in this review include the state of dissolution of surfactants (*I*) in petroleum oil, the synthesis of *I* for petroleum products and examples of applications of *I* for petroleum products.

Application of surfactants for anticaking agents of fertilizers. Haruhiko Arai (Kao Soap Co., Sumida-ku, Tokyo, Japan). *Yukagaku* 18, 668–72 (1969). The surfactants used as anticaking agents in fertilizers are discussed under the headings of fatty acid and their derivatives, other anionic, cationic, nonionic and high-molecular agents.

Application of surfactants for soil conditioning agents. Saburo Imoto and Tsutomu Nakamura (Kurashiki Rayon Co., Kurashiki, Okayama-ken, Japan). *Yukagaku* 18, 649–54 (1969). A review with 50 references. The interaction of the surface of clay particles and high-molecular weight polymers is described in relation to nonionic, cationic and anionic surfactant polymers.