

LONGER SURVIVAL TIME OF RATS FED OXIDIZED VEGETABLE OILS. H. Kaunitz, Ruth E. Johnson, and L. Pegus (Dept. of Pathology, College of Physicians and Surgeons, Columbia Univ., N.Y.). *Proc. Soc. Exp. Biol. Med.* 123, 204-6 (1966). Feeding of mildly heated and aerated butter and lard reduced the average span (although not statistically significantly) of male rats fed these fats at a level of 20% in their diets. With similarly treated soybean and corn oils, survival was as good as with fresh animal fats whereas feeding of fresh vegetable oils led to significantly shorter life spans. The results were in agreement with those of a previous study comparing beef and chicken fats with olive oil. Thus, fresh olive oil, soybean oil, and corn oil appeared to contain, despite processing for human consumption, materials toxic to rats. These substances were inactivated by mild heating and aeration.

AN ELECTRON MICROSCOPIC STUDY OF LIPOPROTEIN PRODUCTION AND RELEASE BY THE ISOLATED PERFUSED RAT LIVER. A. L. Jones, N. B. Ruderman and M. Guillermo Herrera (Dept. of Medicine, Elliott P. Joslin Res. Lab., Harvard Med. School, Boston, Mass.). *Proc. Soc. Exp. Biol. Med.* 123, 4-9 (1966). Dense osmiophilic bodies, 300-800 Å in diameter, appear in isolated rat livers perfused with high concentrations of linoleic acid. After 2 minutes of perfusion, these bodies are very numerous in the endoplasmic reticulum and Golgi apparatus. They are first seen in significant numbers in the space of Disse at 5 minutes. Similar granules are present in the final media of livers perfused with fatty acid and the  $d < 1.006$  fraction of human and rat sera. The data suggest that these bodies are very low density lipoprotein and indicate that the isolated perfused liver is an excellent experimental system for morphological study of lipoprotein metabolism.

MECHANISM OF SUCKLING RAT HYPERCHOLESTEROLEMIA: DIETARY AND DRUG STUDIES. R. A. Harris, J. E. MacNintch and F. W. Quackenbush (Dept. of Biochem., Purdue U., Lafayette, Indiana). *J. Nutr.* 90, 40-6 (1966). The objective of this study was to determine the cause(s) of the hypercholesterolemia which is known to occur in suckling rats. A semi-purified, milk-simulating diet fed to 21-day-old rats upon weaning was found to maintain the hypercholesterolemia condition. With this diet, the mechanism of suckling rat hypercholesterolemia was investigated by testing the effect of dietary levels of lactose, bulk, polyunsaturated fatty acids, cholesterol and fat. The condition appears to be dependent upon the high fat content of rat milk but independent of the dietary bulk, polyunsaturates, and carbohydrate source. Isocaloric diets were used to establish the dependency upon the fat content of diet. Feeding experiments suggest that dietary cholesterol is not necessary for maintaining hypercholesterolemia for short periods of time, but isotopic balance studies show that the dam contributes a portion of the cholesterol found in the plasma of suckling rats. Ethyl linoleate, *p*-chlorophenoxyisobutyrate (CPIB), benzmalecene, and  $\beta$ -diethylaminoethyl diphenylpropyl acetate hydrochloride were found not to be effective as hypocholesterolemic agents in the suckling rat hypercholesterolemia. L-Thyroxine was active in lowering plasma cholesterol in this system, but it increased liver free and total cholesterol. Liver wet weight, dry weight, and protein content increased in response to CPIB.

LIPOLYSIS IN HOMOGENATES OF ADIPOSE TISSUE: AN INHIBITOR FOUND IN FAT FROM OBESE RATS. H. A. Haessler (Science and Engineer. Inst., Waltham, Mass.). *Science* 154, 909-10 (1966). The presence of a lipid-bound inhibitor in adipose tissue of rats with hypothalamic obesity may explain the failure of the tissue to release fatty acids on epinephrine stimulation. Aqueous extracts of tissue from obese animals showed no deficiency of lipase activity, but when whole homogenates of epididymal fat from lean and obese animals were mixed, 25% tissue from obese animals reduced 73 percent the release expected from tissue of lean controls.

EFFECT OF PHOSPHOLIPIDS ON INDUCED ENZYME RELEASE FROM MITOCHONDRIA. S. Estrada-O., A. Carabez T., and A. Cabeza G. (Inst. for Enzyme Res., Univ. of Wis., Madison). *Biochemistry* 5, 3432-43 (1966). When incubated in an appropriate medium, mitochondria release glutamic aspartic transaminase (GOT) and glutamic dehydrogenase activities of the supernatant solution in a temperature-dependent fashion. This phenomenon is inhibited by chromatographically pure phosphatidylethanolamine, phosphatidylserine, phosphatidylcholine, and sphingomyelin. A relationship seems to exist between the blocking activity of these molecules and the unsaturation of their constituent fatty acids, since saturated phospholipids do not prevent release of enzymes. Some free unsaturated fatty

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## • Names in the News

A. M. ALTSCHUL, of the USDA's Southern Utilization Research and Development Division, has become the first recipient of the Technion Achievement Award given by the Chicago Chapter of the American Society for Technion, the Israel Institute of Technology. In choosing Altschul, the society cited his work in combating protein deficiency in the underdeveloped nations of the world. Through his research on cottonseed at the Southern Division, Altschul became interested several years ago in the possibilities of cottonseed flour and other vegetable products as sources of low-cost protein to supply this need.

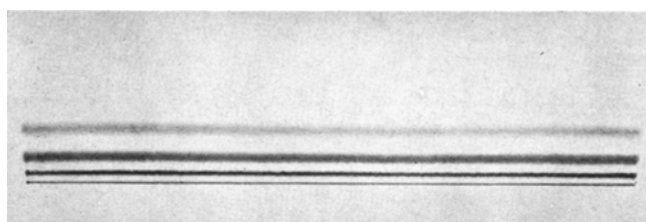
T. H. KRITCHEVSKY is now associate director of the research and product development program of the R. I. T. A. Chemical Corporation. He was formerly a research associate in steroid biochemistry at the Sloan-Kettering Institute.

J. D. MAHONEY, vice president and general manager of the organic chemicals division of the Monsanto Company, was elected president of the Synthetic Organic Chemical Manufacturers Association for 1967. T. P. TURCHAN will act as senior vice president, E. M. MAY as vice president and R. L. Duncan as treasurer of the Association for 1967.

JOHN PETERSON will now act in the capacity of executive vice president of Drew Chemical Corporation, in addition to his work as president of the firm's St. Louis refinery, the Drew Foods Corporation.

ALLAN BERNE-ALLEN (1965) received the Recognition Award of the National Renderers Association at their 33rd National Convention in Washington. He has just retired after eight years as a research consultant for the Association.

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acids (e.g., oleic acid) induce the release of GOT activity from mitochondria, whereas some saturated fatty acids moderately protect or are ineffective in this process. Phospholipids are ineffective in preventing the oleic acid induced release of GOT. If lysolecithin or lecithinase D is added to the incubation medium, the release of enzyme activity from the mitochondria is enhanced. The significance of these findings in relation to the possible role of phospholipids and some of their derivatives in the regulation of lecithinase and lysolecithin activity in mitochondria is discussed.

**ETHANOL AND ALIMENTARY LIPEMIA.** A. C. Brewster, H. G. Lankford, M. G. Schwartz and J. F. Sullivan (Dept. of Med. and Pathology, Creighton Univ., School of Med., 2305 S. 10th St., Omaha, Neb.). *Am. J. Clin. Nutr.* 19, 255-9 (1966). It was found that following the ingestion of alcohol in an amount comparable to that commonly used by many people as an appetizer triglyceride levels were significantly higher during the postprandial period than when the same meal was ingested without alcohol. Evaluation of gastric emptying and of post-heparin lipolytic activity indicated that the alcohol-augmented alimentary lipemia did not result from alteration in either of these functions. Alcohol alone is known to elevate triglyceride levels. The increase in postprandial lipemia produced by alcohol, therefore, must represent increased hepatic triglyceride synthesis and release. This may result from increased peripheral fatty acid mobilization or by a more direct influence of alcohol on fat synthesis.

**EFFECT OF CARBOHYDRATE AND FAT INTAKES UPON THE ACTIVITIES OF SEVERAL LIVER ENZYMES IN RATS, GUINEA PIGLETS, PIGLETS AND CALVES.** R. L. Baldwin, M. Ronning, C. Radanovics and G. Plange (Dept. of Animal Husbandry, Univ. of Calif., Davis, Calif.). *J. Nutr.* 90, 47-55 (1966). The effect of 4 diets containing a wide range of carbohydrate and fat upon the activities of a number of liver enzymes in rats, guinea piglets, calves and piglets were investigated. The results indicated that large adaptive enzymatic changes occurred in rats fed high carbohydrate diets but not in guinea piglets, piglets and calves. The activities of most of the enzymes studied changed in logarithmic relationship to the ratio, carbohydrate calories-to-carbohydrate + fat calories, in the diets indicating that the enzymatic adaptations occurred in response to changes in proportions of energy contributed by carbohydrate and fat rather than to changes in the amounts of these components per se. The results indicated that calves, guinea piglets and piglets have much lower capacities for adaptation to high carbohydrate, low fat diets than rats, due either to species differences in rats of physiological development after birth or to other inherent species differences. The activities of all the enzymes whose functions have been related to fat synthesis were much lower in calves than in rats.

**EFFECT OF CHOLESTEROL-LOWERING DIET ON PRODUCTION OF ADRENAL CORTICAL HORMONES IN MAN.** F. E. Abbo and P. D. Meyer (Dept. of Internal Med., Veterans Administration Hospital, Iowa City, Iowa). *Am. J. Clin. Nutr.* 19, 232-6 (1966). Twenty-three men were placed on a cholesterol-lowering diet for a period of three months and their 17-ketosteroid (17-KS) and 17-hydroxycorticosteroid (17-OHCS) excretion rates studied before and after the diet. In the group of fifteen subjects who succeeded in lowering their serum cholesterol level, no change in 17-KS excretion rates was observed. However, there was a statistically significant decrease in the average excretion rate of 17-OHC ( $P = 0.02$ ). Also, when compared to a control group of forty-three men, a significant number in the experimental (cholesterol-lowering diet) group of 23 subjects showed an increase in their 17-KS to 17-OHCS ratio. Although an increase in the 17-KS to 17-OHCS ratio is interpreted as favorable, the magnitude of these changes observed in the present study were not large enough to be considered physiologically important. Therefore, under these conditions, lowering of the serum cholesterol level by dietary means does not appear to adversely affect human adrenal cortex function, and might possibly influence it favorably.

**REDUCTION OF CAROTENOID EPOXIDES WITH LITHIUM ALUMINUM HYDRIDE.** B. P. Schimmer and N. I. Krinsky (Dept. of Pharmacol., Tufts Univ. School of Med., Boston, Mass.). *Biochemistry* 5, 3649-57 (1966). A study of the chemical reduction of antheraxanthin and neoxanthin, the epoxide carotenoids of *Euglena gracilis*, was undertaken in an attempt to elucidate the mechanism of the enzymatic reductive deepoxidation of carotenoids. These epoxide carotenoids were treated with a large excess of  $\text{LiAlH}_4$ , and the resultant reaction mixtures

were separated into several fractions by gradient elution from silica gel G-Celite (1:1). The individual fractions were characterized by absorption spectra, relative polarity values, and dehydration reactions with acidic chloroform. The 5,6-epoxide groups of antheraxanthin and neoxanthin, upon reduction with  $\text{LiAlH}_4$ , yield, along with the expected 5-hydroxyl derivatives, equal amounts of the unexpected 5,6-olefins via a mechanism which does not involve dehydration of an hydroxylated intermediate. The mechanism of enzymatic deepoxidation may be like the  $\text{LiAlH}_4$  reaction reported here. Based on our results, we suggest that the 3-hydroxyl and 5,6-epoxide groups of antheraxanthin and neoxanthin are in a *cis* configuration on the ionone ring.

**SERUM CHOLESTEROL RESPONSE TO CHANGES IN DIETARY LIPIDS.** A. Keys and R. W. Parlin (Lab. of Physl. Hygiene, Univ. of Minn. School of Public Health, Minneapolis, Minn.). *Am. J. Clin. Nutr.* 19, 175-81 (1966). An analysis is presented of the data from 99 sets of controlled experiments, each providing average serum cholesterol response ( $\Delta$  cholesterol) in a group of men, in calorie balance, to a known change in the diet. The recently reported data of Hegsted *et al.* are in good agreement with predictions based on a formulation published earlier, the correlation between observed and predicted values being  $r = 0.92$ , and the root mean square error 14.9 mg. cholesterol per 100 ml. of serum.

**ATHEROSCLEROSIS AND LIPID METABOLISM.** Chikayuki Naito (Univ. Tokyo). *Yukagaku* 15, 439-55 (1966)—A review with 111 references.

**SPECULATION ON THE ROLE OF EPOXY ACIDS AS INTERMEDIATES IN THE BIOSYNTHESIS OF POLYUNSATURATED FATTY ACIDS.** F. D. Gunstone (St. Salvator's College, Univ. of St. Andrews, Scotland). *Chem. Ind. (London)* 1966, 1551-4. Two reactions of epoxides provide a basis for a series of speculative biosynthetic sequences. In the C-18 series it is proposed that oleic is converted to linoleic acid and that this serves as a precursor for a variety of other polyunsaturated acids, including those with methylene-interrupted unsaturation and those with conjugated unsaturation. These schemes proceed almost entirely through intermediates which are now known to occur naturally and provide rational routes to such unusual acids as the C10-C8 pair in stillingia oil and the prostaglandins.

**THE DETECTION OF STEROIDS ON SILICA GEL G LAYERS.** I. S. Shepherd, L. F. Ross and I. D. Morton (Unilever Research Lab., The Frythe, Welwyn, Herts.). *Chem. Ind. (London)*, 1966, 1706-7. Sterols and related compounds (steryl esters) on silica gel plates develop characteristic colors when sprayed with potassium dichromate in sulfuric acid and heated in the range of 40-90°C. After noting the position of the spots and the color changes, the plate may be rapidly heated to about 180°C when all compounds char. Thus non-steroid compounds present can be detected on the same plate. At 76°C stigmasterol and sitosterol give different colored spots.

**OCCURRENCE OF VITAMIN E IN BLACK TEA.** A. S. Tirimanna and R. L. Wichremasinghe (Tea Res. Inst. of Ceylon, St. Coombs, Talawakele, Ceylon). *Chem. Ind. (London)* 1966, 1719. Reducing compounds in black tea were first separated from the chlorophylls by column chromatography, and the fractions were subsequently analyzed by thin layer chromatography. The fractions contained a compound having an  $R_f$  value identical with that of alpha-tocopherol. The identity of the compound with vitamin E was confirmed by the following color reactions: pink with Emmerie-Engel reagent, turquoise blue with phosphomolybdic acid, bronze with Sonnenschein reagent, chocolate with Tollen's reagent, and light blue with potassium ferricyanide. The identity of 3 other compounds which also give positive Emmerie-Engel reactions is being investigated.

**OCCURRENCE OF STEAROLIC ACID IN SANTALACEAE SEED OILS.** L. J. Morris and M. O. Marshall (Unilever Res. Lab., Sharnbrook, Bedford). *Chem. Ind. (London)* 1966, 460-1. Analysis of *Exocarpus cupressiformis*, *Santalum album* and *Santalum acuminatum* oils showed the presence of the following fatty acids: 14:0, 16:0, 16:1, 18:0, 18:1, 18:2, stearolic and santalbic.

**THE OCCURRENCE OF LINOLENIC ACID AND STEAROLIC ACID IN SANTALUM ACUMINATUM SEED OIL.** F. D. Gunstone and R. Subbarao (The University, St. Andrews, Scotland). *Chem. Ind. (London)* 1966, 461-2. The seed oil contained the following acids (as methyl esters % wt) 16:0, 3.4%; 16:1, 1.2; 18:0, 2.1; 18:1, 47.2; 18:2, 2.5; 18:3, 2.0; 18:1,9a, and 2.9; and 18:2,9a,11t, 38.7.

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## • *New Products*

ACE GLASS, Vineland, N. J., offers a new complete system of liquid chromatography featuring threaded glass/nylon couplings that require no clamps or springs. The system is suitable for chemical and biological, preparative and determinative uses. Fittings are interchangeable within each diameter.

SUPELCO, INC. Bellefonte, Pa., now has available 99% pure 1,3 diglycerides of myristate, palmitate and oleate. The compounds are completely free of the 1,2 isomers and are homogeneous by chromatography.

OLIN MATHIESON, CHEMICAL CORP., N. Y., N. Y., now produces adipic dihydrazide and sebacic dihydrazine in the form of white powder. Olin suggests adipic dihydrazide be used as an intermediate in the preparation of resins and synthetic films, and as a polymer modifier. Sebacic dihydrazide, a heat-activated curing agent for epoxy resins, has been found useful as an extender for urethane polymers, as an inhibitor for color and odor formation in soaps, and in the preparation of high molecular weight polymers.

E. H. SARGENT & CO., Chicago, Ill., has a new line of spectrophotometers and accessories. The Coleman Model EPS-3T Hitachi ratio recording spectrophotometer features a double and single beam, 170-2600 m $\mu$  range, built-in time drive and gas purge system. The Bausch & Lomb Spectronic 505 ratio recording spectrophotometer also has a double and single beam, in addition to constant bandpass and resolution, and built-in wavelength calibrating source. Other models are available.

PENNSALT CHEMICALS CORP., Philadelphia, Pa., has introduced a new series of single-purpose Sharples centrifuges for dewatering crystalline and fibrous materials. Features include 30-inch diameter conical screen bowls, rinse design employing a rotating baffle, and modular construction which permits one drive unit to serve any number of interchangeable bowl and casing assemblies.

GARDNER LABORATORY, INC., Bethesda, Md., has available the Sherwin-Williams Minature Sand Mill for use in determining color, strength and dispersibility of pigments and in dispersing test batches and preliminary formulations of new products. Gardner says the basic operating principle is in agreement with usual factory methods of production.

MOISTURE REGISTER CO., Alhambra, Calif., has a new moisture meter, G8, for the testing of granular and powdered materials. Sampling may be done by anyone on the production line in less than one minute. No weighing is necessary.

JARRELL-ASH, Waltham, Mass., is the exclusive US distributor for the new Radyne plasma torch. The unit can be used with most spectrograph and spectrophotometer designs for direct analysis of both powders and solutions without prior separation.

C. W. BRABENDER INSTRUMENTS, INC., South Hackensack, N. J., has made available a new line of heavy duty thermal liquid circulating Thermotrons. They can be used to control the temperature of all types of laboratory and pilot equipment, such as spectrophotometers, refractometers, calorimeters, and viscometers.

EMERY INDUSTRIES, INC., Cincinnati, Ohio, has made available a 100% vegetable-derived oleic acid, Emery 3758-R, which is specially processed to meet the requirements of the Federal Food and Drug Administration Regulations.

EMERY also has a new addition to its line of polybasic acids, Empol 1043 Trimer Acid. Produced by a process for the polymerization of unsaturated fatty acids, it possesses a much lighter color (9 Gardner) than any previously available Emery trimer acid.

## Call for AOCS Nominations for Honored Student Program

Nominations for awards from the AOCS Honored Student Program for the AOCS Spring and Fall Meetings of 1967 are now being accepted. These awards will give outstanding graduate students an opportunity to hear technical sessions at New Orleans and Chicago and to participate in all the activities of the Meetings. Ten graduate students will be selected for the year 1967, and each of them will receive a certificate and an all-expense-paid-trip, including round trip air fare, registration and activities fees, hotel room and meal expense.

The award, under the sponsorship of the AOCS Education Committee, N. H. Kuhrt, Chairman, and the AOCS Honored Student Program subcommittee, under the direction of S. S. Chang, was designed to stimulate interest in the study of the chemistry and technology of fats and oils. This program is financially supported by Armour Grocery Products Company; The Baker Castor Oil Company; Central Soya Company, Inc.; Corn Products Company; Durkee Famous Foods; Emery Industries; The Fatty Acid Producer's Council; National Dairy Products Corporation; Pacific Vegetable Oil Corporation; and Swift and Company.

Nominees must have been enrolled in their present graduate school for at least one year and must have conducted research in the field of lipids for their dissertations. Judgment of nominations will be based upon the academic status and experience of the Nominee, recommendation of his major professor and a statement from the Nominee on his interest and research plan in the field of fats and oils.

Any faculty member of a college or university may nominate students for the award. Nomination forms will be sent to those who have attended at least one AOCS meeting or have published at least one technical paper in the JAOCS during the previous year. Requests for information and nomination forms should be sent immediately to S. S. Chang, Food Science Department, Rutgers, The State University, New Brunswick, N.J.

## New University Programs Promote Water Studies

A number of educational programs forwarding the study of water subjects has recently been announced:

1) A bill establishing a \$20-million, 2-year program of aid to sea-grant colleges to advance the development of marine resources was approved by Congress. This bill is analogous to the land-grant college program.

2) The College of Engineering at Cornell University announces a new department for Water Resources Engineering. It unifies graduate and undergraduate teaching and research activities in fluid mechanics, hydraulics, hydrology, air and water resources engineering and water resources planning and management. C. D. Gates, professor of civil engineering at Cornell, has been named chairman of the new department.

3) A department of Environmental Engineering has been established at Illinois Institute of Technology and will grant both MS and PhD degrees. The new department will continue IIT's emphasis on water supply and air and water pollution control.

4) The Ninth Sanitary Engineering Conference, entitled "Instrumentation, Control, and Automation for Water Supply and Wastewater Treatment Systems," will be held Feb. 7-8, 1967, at Urbana, Ill., for sanitary engineers in government, industry, or private practice, and for water works managers and operators.

(Continued from page 34A)

## • Drying Oils and Paints

CHINESE TUNG OIL. Anon. *Peint. Pig. Vernis* 41 (4), 253-4 (1965). A brief description is given of the main varieties of tung trees grown in China, of which *Aleurites Fordii* and *Aleurites montana* provide the principal sources of tung oil, and of developments in the production program. Various by-products of tung cultivation are also noted. (Rev. Current Lit. Paint Allied Ind. No. 290).

## • Detergents

APPLICATION OF AN EQUATION FOR THE ADSORPTION OF IONIC SURFACTANTS TO EMULSION CHARACTERIZATION. R. C. Groot, (Algemene Kunstzijde Unie N.V., Arnhem, The Netherlands). *Tenside* 3, 193-4 (1966). An equation for the adsorption of ionic surfactants was derived in previous work, by introducing an expression for the electrostatic component of the free energy of adsorption in the Langmuir adsorption isotherm. This equation gives a good representation of the adsorption data obtained on emulsion samples stabilized with different concentrations of surfactants in the absence or presence of NaCl. The surfactant saturation adsorption per ml. of emulsified oil can then be calculated. This characteristic quantity for an emulsion is a direct measure of the interfacial area of the emulsion, which can be calculated when the cross sectional area of the surfactant ion at the interface under conditions of saturation adsorption is known. A relatively easy method is thus available for the determination of the interfacial area of emulsions, which can be used also for determining the interfacial area of other disperse systems, e.g. latex emulsions. Examples are given, illustrating the use of the equation for determining the interfacial area of emulsions and its variation with age.

DETERMINATION OF CARBOXYMETHYL CELLULOSE IN DETERGENT POWDERS. P. Kikolski, Z. Stefaniak and M. Wegrzynowicz (Inst. Gen. Chem., Warsaw, Poland). *Tenside* 3, 225 (1966). Several different methods for determining the carboxymethyl cellulose (CMC) content of washing powders were compared to establish their usefulness for research work as well as for production control. Known amounts of CMC were added to soaps and to synthetic detergent powders and their active content was determined. The samples were examined by the spectrophotometric method due to Black, the gravimetric method due to Reutenauer and by the oxidation method due to Pollok. The most accurate results were obtained by Pollok's method (oxidation of separated cellulose glycol acid with potassium dichromate); the relative errors in this case were about 5%. Errors were frequently found when using the spectrophotometric method, due to incomplete solution of CMC in sulfuric acid. This was often evident in the analysis of soap powders since, because of the separation of fatty acids, it was not possible to see whether the CMC had completely dissolved. A systematic error occurs in the Reutenauer method, probably due to a certain solubility of the carboxylated cellulose in the diluted alcohol solutions. The oxidation method of Pollok was found to be sufficiently accurate, easily carried out and therefore generally and widely applicable.

THE FINAL CONCENTRATION OF SURFACTANTS AT THE SOLUTION/AIR INTERFACE AS A FUNCTION OF TIME. G. Schwen (Ludwigshafen am Rhein, Germany). *Tenside* 3, 69-71 (1966). The surfactant concentration at the solution/air interface was measured as a function of time on solutions of sodium dodecyl sulphate, sodium oleate and an ethylene oxide adduct of lauryl alcohol. Tests were continued up to 300 hours and repeated several times, while the natural evaporation occurring during this time was carefully measured and compensated for. For all three surfactants tested, the final surface tension was found to be independent of total surfactant concentration, of the amount of electrolyte present or of any solution aging effect. An analogy is offered between the asymptotic tendency of surface tension at the water/air interface and the concept of c.m.c. Just as an increase in total surfactant above the c.m.c. does not cause further decreases in surface tension, so do the experiments reported indicate that the final concentration at the interface is largely independent of the solution concentration, having reached the point where the surface is completely occupied by active molecules.

CORRELATION BETWEEN DETERGENCY AND COMPOSITION OF LINEAR ALKYL BENZENES. P. Peri and A. Zanella (Edison S.p.A., Milan, Italy). *Riv. Ital. Sostanze Grasse* 42, 573-83 (1965). Twenty samples of linear alkylbenzene, characterized by different distributions of their alkyl chains and different molecular weights, have been sulfonated and their detergent power tested in an Atlas Launderometer, using Empa standard soiled cloths. The results, measured by changes in cloth reflectance, were correlated statistically with several parameters defining the alkylbenzene composition, principally mean molecular weight. The statistical evaluation indicates a maximum in detergency for a molecular weight varying from 253 (at 200 ppm hardness) to 258 (at 50 ppm hardness). The optimum molecular weight also shifts upwards (by 3-5 units) as the washing temperature is increased from 25C to 75C. Hardness has a definite depressing effect on detergency while high temperatures always increase detergent power. A correlation was also shown to exist between the % of alkyl chains lower than C<sub>12</sub> and detergent power, with poorer results being obtained at the higher values of this parameter. No attempt was made to examine the effect of scatter of the alkyl chains around their mean molecular weight.

BIODEGRADABLE ALCOHOL SULFATE SURFACTANTS FROM CHLORINATED EGYPTIAN KEROSENE. B. A. Gebril and H. Abou-Zeid (Univ. of Alexandria, U.A.R.). *Tenside* 3, 150-4 (1966). An Egyptian kerosene was refined, distilled into 3 fractions (10 mm. b.p.: 60-70C, 90-100C, 120-130C), which were then chlorinated at 40C for different times to yield chlorinated products having the same percentage chlorination. These were converted to the corresponding alcohols and sulfated. Examination of the characteristics of the produced surfactants revealed that they differed in surface active properties, especially in biodegradability, the straight chain alcohol sulphates produced from the heaviest fraction (b.p. 120-130C) being the ones most rapidly degraded.

MECHANISM AND CLASSIFICATION OF ANTIFOAMING PHENOMENA. S. Okasaki and T. Sasaki (Univ. of Tokyo, Japan). *Tenside* 3, 115-8 (1966). A systematic investigation of antifoaming phenomena, including 21 different antifoaming agents and sodium dodecyl sulfate, has been conducted. An important distinction is made between defoaming and foam inhibiting agents and also between homogeneous and heterogeneous systems, depending on whether the antifoaming agent is added pure or as an aqueous solution. Good defoaming agents are not necessarily also strong foam inhibitors and their activity in homogeneous and heterogeneous systems can also be quite different. Spreading coefficient or degree of insolubility are not by themselves sufficient indices of effectiveness, the decisive factor being the ability to displace the absorbed film of foaming agent from the interface.

THE SYNTHESIS AND SURFACE ACTIVE PROPERTIES OF POSITIONAL ISOMERS OF Na AND K N-HEXADECYL-SULPHATES-(1) TO -(8) AND OF SOME Na AND K 1-(N-ALKYL)-N-DODECYL SULPHATES-(1). F. Püschel (Sci. Acad. Berlin, Germany). *Tenside* 3, 71-80 (1966). The eight positional isomers of Na and K n-hexadecyl sulphate and the Na and K 1-(n-alkyl)-n-dodecyl sulphate-(1), with alkyl radicals ranging from methyl to n-propyl, have been prepared as pure compounds by means of a synthesis in which the possibility of isomerization was excluded. Besides differences in solubility, ease of crystallization, hygroscopicity and melting point, the surface active characteristics (e.g., surface tension, wetting, foaming and detergency) are found to be characteristically dependent upon the position of the hydrophilic group in the molecule. For examples, alkyl sulphates with the sulphate group at C<sub>4</sub> or higher are hygroscopic. As the hydrophilic group is displaced towards the center of the chain, the surface activity and the cmc value of the range of hexadecyl sulphates both increase.

THE PROBLEM OF DETERMINING SMALL AMOUNTS OF NON-IONIC SURFACTANTS IN WASTE WATER AND SEWAGE. H. Heinerth (Henkel & Cie. GmbH., Düsseldorf, Germany). *Tenside* 3, 109-14 (1966). The analytical determination of non-ionic surfactants in water and sewage is a problem which has so far not been solved satisfactorily. Various methods of determining small amounts of non-ionics, especially ethoxylated compounds, are discussed, most of which are based on reactions with the ether oxygen of the ethoxylates. The main difficulties arise in separating interfering substances as well as from the necessity of knowing beforehand what type of ethoxylate is being analyzed. A thin layer chromatographic method appears promising, but it is too lengthy for routine determinations.