Linseed oil at the surface of titanium dioxide pigment. W. R. Lasko and L. S. White(National Lead Company, Sayreville, N. J.). *Anal. Chem.* **26**, 1631(1954). Electron micrographs of particulate materials often give a very fuzzy appearance which cannot be completely associated with the intrinsic surface of the material. By means of a high magnification technique it has been found that such surface characteristics may be due to the presence of adsorbed dispersant. A study has been made of the surface roughness of titanium dioxide pigment particles, as well as the fuzziness developed upon the addition of various amounts of unpolymerized and polymerized linseed oils, used as dispersants. In some instances the nonuniform adsorption of these oils indicates the heterogeneous nature of the particle surface. The need for the use of controlled amounts of dispersant when studying the intrinsic surface characteristics of particulate materials is indicated.

Vinyls. W. H. McKnight(Mellon Institute). *Paint Varnish Production* **44**(11) 64(1954). These resins offer a combination of properties for formulating primers and finishes having good toughness and adhesion, moisture-, salt spray-, chemical-, and solvent-resistance.

Rapid identification of glycols in alkyd resins. C. B. Jordan (Aberdeen Proving Ground, Md.). *Anal. Chem.* **26**, 1657(1954). A rapid method, which utilizes only standard laboratory equipment, has been developed for qualitatively detecting vicinal glycols of low molecular weight in alkyd resins. It is based on reflux distillation, making use of a ternary azeotropic mixture formed by xylene, the glycols, and water, xylene being the refluxing medium.

Production technology of shale drying oil. A. A. Ivanova and A. I. Bespalko. *Byull. Obmenu Opyt. v Lakokrasoch. Prom.* **1953**(4), 22-6; *Referat. Zhur., Khim.* **1953**, No. 7721. Shale drying oil was prepared by oxidation of shale oil with air at 140-150° in the presence of 3% of catalyst "MK" to a viscosity of 10-12 min. in a funnel NIILK (Nauchno-Issled. Inst. Lasokrasochnoi Prom.) at 18-20°. Dehydration was carried out at 240-250° in the presence of an additional 3% "MK" to a viscosity of 17-18 sec. in funnel VZ-4 after diluting with xylene in 1:1 ratio. Paint prepared from iron ocher with this drying-oil base lasted for 1½ years and powdered Al paint with this base for 2 years. Analyses are given of raw, oxidized, and dehydrated shale oils. (*C. A.* **48**, 11079)

The oxidation of monoethenoid fatty acids and esters. Catalytic oxidation of n-propyl oleate. The oxidation products. A. J. Feuell and J. H. Skellon(Acton Technical College, London). *J. Chem. Soc.* **1954**, 3414. The products of catalytic oxidation at 55°, 85°, and 120° of *n*-propyl oleate by gaseous oxygen have been resolved. The main products resulting from transformation or decomposition of the initially formed hydroperoxides are 9:10-epoxy- and 9:10-dihydroxy-stearic acids, unsaturated keto-esters, and the scission fragments nonanoic, decanoic, suberic, and azelaic acid. With increasing temperature and duration of oxidation, the unsaturated keto-esters tend to dimerize and form oils and resins that still retain their ketonic character. The observed rapid loss of unsaturation at the higher temperatures, and the formation of appreciable quantities of epoxy- and dihydroxy-stearic acid derivatives are compatible with a mechanism involving direct attack on ethenoid linkages by free hydroxyl radicals generated by thermal homolytic fission of the initially formed hydroperoxides.

Mould growth on painted surfaces. L. D. Galloway. *Paint Oil Colour J.* **126**, 81-8(1954). A lecture covering the principal factors involved, the methods of attack, tests and preservatives.

Studies on oxidized films of trilinolein and trilinolenin. J. R. Chipault and Evelyn McMeans (Hormel Institute). *Off. Dig. Federation Paint Varnish Production Clubs* **26**(354), 548 (1954). Trilinolein and trilinolenin films were collected at two levels of oxidation, and after the peroxides had been determined the remainder of the films were reduced and saponified. The hydroxyl, *alpha* glycollic, and carbonyl content, and the unsaturation of the free acids were then measured. In addition, the neutralization equivalent, molecular weight, and ultraviolet and infrared spectral characteristics of the acids were determined.

Vehicle problems. H. Burrell(Interchemical Corporation). *Paint Varnish Production* **44**(11), 68(1954). There is need for custom alkyds in small volume, low-cost epoxides, and heat stable vinyls.

High polymer theory of the wrinkle phenomenon. H. Burrell (Interchemical Corporation). *Ind. Eng. Chem.* **46**, 2233(1954). Wrinkling occurs when a drying oil composition forms a surface skin lying on top of a liquid underlayer of monomer. This polymeric skin is swollen by the liquid layer. The strains set up by the swelling are relieved by wrinkling when the modulus of elasticity of the swollen gel is low enough. By use of this theory, it is possible to formulate improved industrial wrinkle finishes that are more nearly foolproof in their tendency to give the same pattern time after time.

Tall oil—its function in the paint industry. Part III—Tall oil in the protective coatings industry. W. Brushwell. *Am. Paint J.* **39**(6), 80(1954). Discussed in this part are (1) the chemistry of tall oil in relation to its uses, (2) esterification, (3) decarboxylation, (4) sulfonation, (5) sulfurization, (6) polymerization, (7) reaction with styrene, etc., (8) tall oil soaps, and (9) rosin ester varnishes.

Tall oil—its functions in the paint industry. Part II—Properties of commercial tall oil products. W. Brushwell. *Am. Paint J.* **38**(51), 60(1954). The chemistry of available tall oil products is discussed.

Hydrogen transfer. Part VI. — Metal-catalyzed transfer-hydrogenation of ethylenic compounds. E. A. Braude, R. P. Linstead and P. W. D. Mitchell(Imperial College, London). *J. Chem. Soc.* **1954**, 3578. Cyclohexene, and similar hydroaromatic compounds which disproportionate at moderate temperatures in the presence of metal catalysts, can be used as hydrogen donors for the reduction of ethylenic and acetylenic bonds in hydrocarbons and carboxylic acids. The disproportionation of the donors is suppressed by the acceptors to varying extents; in favorable cases, transfer occurs exclusively although it usually proceeds more slowly than does disproportionation in the absence of acceptor. The results can be interpreted in terms of co-adsorption of the donor and acceptor on the catalyst surface.

Polymers. I. Synthesis of an all-cis diene polymer. W. J. Bailey and H. R. Golden (Wayne University). *J. Am. Chem. Soc.* **76**, 5418(1954). The cyclic diene, 1,2-dimethylenecyclohexane, was polymerized to a high molecular weight, all-1,4- all-*cis* diene polymer. This polymer was a white crystalline solid, melting at 165° and possessing no rubber-like properties, even though it is very similar in structure to natural rubber.

Carilla-seed oil gel. J. W. Airan(Wilson Coll., Bombay), *Oils & Oilseeds J.*(India) **4**(9/10), 43-4(1952). Carilla seeds (*Momordica charantia*) yield 35% oil containing stearic (17%), oleic, and linoleic acids, in addition to an unidentified unsaturated (possibly conjugated) acid. The oil, on standing, polymerizes to a yellowish white solid and finally to a highly viscous red liquid. The addition of C_6H_6 or an alcohol extraction of the seed kernels delays polymerization. The Wijs method does not give the complete oil number of the oil. The oil probably contains a resin that induces polymerization in other oils. (*C. A.* **48**, 10355)

The structure of oils and resins: spectroscopy. N. H. E. Ahlers (Unicam Instruments Ltd., Cambridge) and L. A. O'Neill. *Oil and Colour Chemists' Assoc. J.* **37**, 533(1954). The present state of knowledge regarding the structure of oils and resins, including some treated oils and synthetic resins, is reviewed. Problems still outstanding and their technical significance are indicated, and the possibility of solving them by newly developed techniques is discussed. The most important newer technique—absorption spectroscopy—is considered in detail.

The spectroscopic examination of alpha and beta kamlolenic acid. N. H. E. Ahlers and F. D. Gunstone(Unicam Instruments Ltd., Cambridge, England). *Chemistry and Industry* **1954**, 1291. The infrared and ultraviolet absorption spectra of these acids are similar to those of the eleostearic acids. It is concluded that the alpha isomer has the *cis, trans, trans,* or *trans, trans, cis* configuration. The beta acid is said to be the all *trans* isomer.

• Detergents

Lenore Petchaft Africk, Abstractor

Optical whitening agents for detergents. D. A. W. Adams (Hickson & Welch Ltd., Castleford, Yorks, Eng.). *Perfumery, Essent. Oil Record* **45**, 303-7(1954). To be effective as whitening agents, compounds should show intense blue fluorescence, they must be soluble in aqueous solutions, have affinity to cellulosic or other fibers, be essentially colorless, be reasonably fast to washing and light, and be stable to various agents. The chemical constitution of whitening agents is discussed. They should possess a series of conjugated double bonds to give fluorescence, contain one or more solubilizing groups such as sulfonic acid groups, and contain groups such as the NHCO groups, or possess sufficiently high molecular weight, to have affinity for the fiber.

Soiling of fabrics in contact with the skin. D. Frishman (Harris Research Labs., Washington, D. C.). *Am. Dyestuff Reptr.* 43, 751-9 (1954). A technique—the collar method—for soiling fabrics through contact with the skin has been devised and a quantitative method for measuring the accumulated dirt developed. A series of experiments on rate and degree of soiling in relation to fiber type, fabric structure, and finish show the method to be a convenient and realistic means of studying the factors influencing the accumulation of soil in garments. It has also proved of value for investigating soil removal during laundering and dry cleaning.

Testing of textile auxiliaries. Specification for determining the lathering power and foam stability. German Standards Committee. *Melliand Textilber.* 35, 548-9 (1954). Foam is defined as a mixture of air (or gas) and liquid, in which the liquid forms a continuous phase and assumes the form of bubbles connected with each other. The lathering power is the ratio of the foam volume of the sample to the foam volume of sodium oleate solution used for comparison, after standing for one minute. Brief descriptions are given of the method, reagents and apparatus, preparation of the sample, testing conditions, evaluation of the results and test reports.

Use of adsorption columns in the analysis of soap and detergent-stabilized emulsions. R. P. Harker, J. M. Heaps and J. L. Horner. *Nature* 173, 634-5 (1954). Soap solutions and emulsions give, when passed through a column of ZeoKarb 225 (Permutit) mixed with powdered animal charcoal, clear solution from which all organic matter has been removed. The charcoal diminishes the rate of percolation and increases the extent of adsorption; the reason for this is not known. With pure soaps over the concentration range 0.05-0.4%, elution with ethanol gives 98-100% recovery of the fatty acids. The components of an emulsion of purified acid-free lanolin may be quantitatively separated, the soap fatty acids being eluted with ethanol and the lanolin subsequently with trichloroethylene. Sodium cetylsulfate is strongly held on the column, but may be eluted with ethylene glycol and subsequently titrated with NaOH. Lanolin emulsions stabilized with sodium cetylsulfate may be resolved similarly, using ethylene glycol and trichloroethylene in turn.

The kinetics of surface activity. H. Lange (Henkel & Cie, Dusseldorf, Ger.). *Kolloid-Z.* 136, 136-41 (1954). A change in the surface area of a solution of a wetting agent produces a temporary change in the surface tension, σ, tending to oppose the change in area. The motion of a thread of solution along an inclined capillary is hindered by the dynamic change in σ at its 2 meniscuses. The time, t, required for the thread to traverse a given distance was taken as a measure of the dynamic change in σ. For 8 wetting agents, t paralleled the textile wetting time determined by a standard test. For Na dodecyl sulfate above the critical micelle concentration t was the same as for H_2O, but as the concentration was reduced, t passed through a sharp maximum. The distance moved under constant pressure by a receding meniscus was proportional to $\sqrt{t}$. An equation devised for this relation made it possible to calculate the diffusion coefficient for Na sulfosuccinate dihexyl ester. (*C. A.* 48, 11148)

Drying soap under vacuum. A. Lanteri (G. Mazzoni, Busto Arsizo, Italy). *Soap, Chemical Specialties* 30 (11) 42-5 (1954). In the Mazzoni drying process the finished neat soap obtained by the normal full-boiled method, or by other systems, is pumped to a countercurrent preheater where, if toilet soap or soap flakes are to be produced, the temperature is raised to 300-330°F. The preheated soap is sprayed onto the inside wall of a vertical cylindrical flash-chamber. A continuous equilibrium vaporization occurs. The dried and cooled soap in the form of a thin film, is continuously scraped from the wall of the chamber. The soap flakes fall to the bottom of the chamber where they are compressed. The differences between this method and other soap drying methods are discussed. The vacuum drying method has the following advantages: time of exposure of soap to preheating temperature is shortened, and no carbon dioxide or oxygen is presented during drying.

What to look for in powdered hand soaps. L. W. Peck (Peck's Products Co., St. Louis, Mo.). *Soap, Chemical Specialties* 30 (10), 41-2, 199 (1954). The important factors in industrial powdered hand soaps are reviewed. These include actual soap content, types of soaps, types of soluble and non-soluble abrasives, and use of lanolin and germicides.

Chemical effect of washing agents on cellulose fibers. R. Podewin. *Textil-u. Faserstofftech.*, 4, 175-7 (1954). A pressure-boiling method is described which can be satisfactorily used for rapid determination of the chemical effect of alkali and washing agents and auxiliaries on viscose fibers, for the development of fiber-protecting agents, and in products control.

The soiling of textile materials. W. H. Rees (British Cotton Industry Research Assoc., Manchester, Eng.). *J. Textile Inst.* 45, 612-31 (1954). Factors affecting the susceptibility of textile materials to soil during manufacture and in use are reviewed, and the nature of soiling matter and of the forces influencing fabric-soil adhesion are investigated. Laboratory techniques for the assessment of soiling, for investigating the soiling of textile materials by air-borne matter and by contact with soiled surfaces, and for obtaining a measure of the adhesion of soil to fabrics are described and illustrative experimental data presented.

Textile detergents and their properties II. M. Rosch. *Melliand Textilber.* 35, 791-8 (1954). Improved washing techniques by the use of electrolytes, changes in the hydrophobic portion of detergent, variation in charge of fiber and soil, impregnation with concentrated detergent, and builders are considered, and acid washing detergent concentration, liquor ratio, finish, e.g. starch, removal and rinsing are discussed.

Solubilization by potassium laurate solutions containing lauric acid. S. Spring and E. Howard, Jr. (Temple Univ., Philadelphia, Pa.). *J. Colloid Sci.* 9, 371-81 (1954). Studies have been made of the solubilization of benzene by potassium laurate solutions containing lauric acid, with moderate quantities of 1-butanol present to improve solubilities. Up to a concentration of about 25% lauric acid relative to potassium laurate, the influence of increasing acid content is a regular increase in solubilization of benzene.

Testing the serviceability of goods after repeated laundering. O. Viertel. *Melliand Textilber.* 35, 541-5 (1954). Methods of test are briefly discussed. Results using Weltzien's flexing abrasion tester (I) are compared with breaking strength (II). Good correlation is found, the former method being more sensitive to changes in degree of polymerization in the cellulosic material used. I does detect a difference in using synthetic detergent instead of soap in repeated launderings, though II shows none. This difference is attributed to increased ash and lowered fat content obtained with synthetic detergents.

Detergent compositions. Procter & Gamble Co. *Brit. 714,212.* A new and gentle detergent composition consists of one part by weight of a detergent of the group consisting of water-soluble soaps, anionic synthetic detergents, non-ionic detergents and mixtures thereof, and from about one-fifth part to about fifteen parts by weight, of a water-soluble phytate.

Improvements relating to detergent compositions. Colgate-Palmolive Peet Co. *Brit. 714,348.* A detergent composition which normally tends to tarnish German silver contains a tarnish inhibitor consisting of 2,4,5-triamino-1,3,5-triazine.

Detergent compositions. R. D. Stayner (California Research Corp.). *U. S. 2,691,636.* Desirable foaming characteristics and satisfactory foam stability can be imparted to detergent compositions which contain as their surface-active ingredient an anionic water-soluble salt of a straight-chain C_{12}-C_{22} alkyl sulfuric acid, by adding to these compositions a minor amount of a salt of a primary C_{12}-C_{18} straight-chain alkyl amine and an organic acid from the group consisting of higher C_{12}-C_{18} saturated fatty acids, C_9-C_{18} monoalkyl benzene sulfonic acids and C_{12}-C_{18} straight-chain monoalkyl sulfuric acids.

Detergent compositions. A. I. Gebhart and I. J. Krems (Colgate-Palmolive Co.). *U. S. 2,692,235* and *U. S. 2,692,237.* Additives which achieve a synergistic enhancement in detergency and maintain a high level of foaming properties in various detergent compositions consist of certain higher alkyl mononuclear aryl sulfonamide compounds.

Nonsoap detergent compositions containing antitarnishing agents. W. W. Sweet and W. J. Mead (Colgate-Palmolive Co.). *U. S. 2,692,236.* An improved nontarnish detergent consists of a non-soap water-soluble synthetic detergent, a water-soluble polyphosphate compound, and a small amount of a symmetrical N,N'-dibutyl thiourea as a tarnish inhibitor.

Cleansing compositions having antibacterial properties. P. Lipsitz (E. I. du Pont de Nemours and Co.). *U. S. 2,692,862.* Disinfectant soaps and synthetic detergents of high anti-bacterial activity, of good retentivity on the skin and non-toxic and non-irritating to the skin may be obtained by incorporating into the cleansing compositions from 0.5 to 5% by weight of an alkyl derivative of thiocarbamo-sulfenamides.