10708

Appendix 7

Chemical abstracts

PLAINTIFF'S EXHIBIT WV-04446

PLAINTIFF'S EXHIBIT 10708

1938

Brit. J. Exptl. Path. 19, 227-38(1938).—The intraperitoneal inoculation of a saline suspension of leucemic spleen or lymph nodes of 2 different transmission lines depressed the anaerobic glucolytic rates, but not the respiratory nor aerobic glucolytic rates of uninfiltrated lymphoid tissue. The inoculation of similar units of normal spleens of 2 different strains of mice produced no such effect. No inhibition of anaerobic glucolysis could be demonstrated when normal and leucemic lymphoid cells were mixed in Ringer soln. nor when normal cells were suspended in Ringer soln. that had previously bathed leucemia cells.

Harriet P. Holmes

The industrial cancer of workers in asbestos. M. Nordmann. *Z. Krebsforsch.* 47, 288-322(1938).—A description is given of 6 cases of asbestosis with carcinoma of the lung, including 2 cases observed by N. In 5 of the 6 cases the carcinoma was a squamous carcinoma with kornification and the other case was an adenocarcinoma. Five of the 6 carcinomas were in the lower lobe. Most of these cases were younger than the av. case of lung carcinoma. Exposure to asbestos began 15–21 years before and lasted 7–21 years with one exception. In the case of an elderly woman of 71 the exposure to asbestos was only 1 year and 7 months, 17 years before, but her lungs showed a very high degree of asbestosis. The asbestosis takes the form of a diffuse fibrosis throughout the lung with many needles of asbestos present. What property of asbestos is responsible for the cancer developing on the groundwork of asbestosis is not yet known, but there may be in asbestos so-called carcinogenic substances.

Harriet P. Holmes

Report on the investigations carried on in the Schneeberg district by authorization of the governmental commission for fighting cancer. A. Brandt. *Z. Krebsforsch.* 47, 108-11(1938); following abstr.—Cancer of the lung has long been known to be frequent among Schneeberg miners and this article describes a program of an exhaustive study being made to det. under what conditions it occurs.

Harriet P. Holmes

Experimental studies on the question of the Schneeberg cancer of the lung. H. R. Hülmert. *Z. Krebsforsch.* 47, 209-39(1938).—Twenty-eight mice from a stock that were not known to exhibit much spontaneous carcinoma were kept in a Schneeberg mine and survived 2-370 days. Of these, 2 were reserved for radiologic study and only examd. macroscopically. Most of the animals died from respiratory infections. In 7 animals (25%) tumors were found, and in 2 of these there were multiple tumors in different organs. There was no mention of controls. As Schmidtmann (*Ibid.* 32, 377(1930)) has ruled out As in the ore as a cause of the Schneeberg lung tumor, H. thinks that in the mice as in the miners Rn may be considered the cause.

Harriet P. Holmes

The importance of proteins for the production of cancer. R. Reding. *Z. Krebsforsch.* 47, 240-56(1938).—The theory of cancer as a local process and the opposing theory of cancer as a general constitutional disease may be brought in line by considering both as due to protein intoxication with protein-split products. A local breaking down of tissue under the influence of hormones or certain chronic intoxications leads to a flooding of the organism with protein-split products giving rise to the general humoral symptoms of cancer, while on the other hand resorption of exogenous or endogenous protein-split products may lead to local necrosis and proliferation.

Harriet P. Holmes

Etiology of noma. C. Ovrašin, P. Kassay-Barlas and V. Jula. *Arch. Kinderheilk.* 111, 168-71(1938).—In a fatal case there was an increase of neoglobulin and diamino N and a decrease in serum albumin and urea N.

Eleanor M. Humphreys

Transfer of agglutinins from mother to the newborn. Ludwig Schneider and Gustav Papp. *Arch. Kinderheilk.* 114, 91-8(1938).—The agglutinins present in human (anti-coli) horse serum injected into pregnant women are eliminated relatively soon, but if the injection is made shortly before delivery, the agglutinin value of the colostrum on the day of delivery is less than that in the maternal blood serum. In umbilical cord serum and in serum taken from the infant before suckling, agglutinins were not present nor were they found 3 to 6 days after delivery, although in some of these cases undoubtedly agglutinins had been received with the colostrum. In the blood serum of 4 or 5 pregnant women investigated, specific active agglutinins were found and with them the umbilical cord serum and the serum from the infants before the first suckling showed almost the same values. The agglutinin value of the serum of the infants did not rise after several days suckling, despite the presence in the colostrum that they were getting of large agglutinin quantities, and in fact decreased after the third day. These agglutinins were always present in stronger concns. in the colostrum than in the blood serum of the mother. These observations are in contradiction to those showing that in horse, goats and swine, the immunity is entirely of colostrum origin.

Eleanor M. Humphreys

Blood-sugar investigation in sound and toxic nurslings. Klingenberg. *Arch. Kinderheilk.* 114, 199-2(1938).—The blood sugar in healthy infants up to the tenth month varies from 72 to 70 mg. %. In 15 cases of intoxication the blood-sugar values range from 123 to 176 mg. %, and these high figures were obtained even when successful therapy was under way, although the highest figures were obtained in those infants in which successful therapeutics was not established, indicating that exceptionally high blood sugar indicates an unfavorable prognosis.

Eleanor M. Humphreys

Obesity in childhood. Richard Priesel and Leopold Frey. *Arch. Kinderheilk., Beihefte* 15, 1-44(1938).—A review of observations in a special clinic for obese children, indicating that the role of endocrine disturbance is commonly overestd., and that dietary control is often possible in cases attributed to endocrine imbalance. There is a marked tendency for juvenile diabetics under insulin to become obese after puberty, especially girls.

Eleanor M. Humphreys

The variations in the blood phosphorus in children with pneumonia and the effect of therapy with large vitamin D doses. M. Finkelstein. *Monatsschr. Kinderheilk.* 72, 361-77(1938).—In all cases of pneumonia the inorg. P content of the plasma and erythrocytes exhibited a hypophosphatemia before administration of vitamin D. During the febrile period the P curve usually is horizontal and first begins to rise slowly during the convalescence, but in the patients given large doses of vitamin D there is constantly a rapid rise so that by the first afebrile day almost normal values had been reached. The clinical course and prognosis seem to be improved by the vitamin D therapy, although the no. of cases treated is not sufficient for conclusive proof. It was not possible to say whether the hypophosphatemia was the result of an actual decrease of the blood P or a transfer of the P from an inorg. to an org. phase, or reverse.

E. M. Humphreys

Creatine-creatinine metabolism in congenital myotonia and the effect of glycine and prostigmine upon it. Josef Freudenfeld. *Monatsschr. Kinderheilk.* 73, 1-10(1938).—Two cases of myotonia congenita in 2 sisters aged 2½ and 4½ years were studied under a diet free from animal protein. Both showed a high spontaneous excretion of creatine with reduced excretion of creatinine. Addn. of 15 g. of glycine daily to the diet produced a distinct increase of the creatine excretion, while the creatinine values were not much altered. The spontaneous excretion of creatine and the hypercreatinuria after glycine administration showed a relation to the severity of the clinical picture. The muscular inefficiency was not affected by the glycine treatment. Daily injections of prostigmine caused a decrease in the spontaneous creatinuria, and also of the hypercreatinuria produced by glycine; also creatine administered at the same time was retained better. Under the influence of the prostigmine the muscular weakness was transitorily improved.

Eleanor M. Humphreys

Alkaptonuria in an infant. U. S. Rulică. *Monatsschr. Kinderheilk.* 73, 165-6(1938).—Of 42 cases recorded since 1920, 32 are apparently congenital, to which R. adds another case. Most of the cases are males, and fe-

cond. of insulating materials at temps. below 0°. NH₃-cooled brine served as the refrigerant; Cu-constantan couples measured the temps. Frozen moisture had little effect on the heat cond. of felt, since felt is repellent to H_2O, thereby preventing the formation of a continuous moist heat conductor. Moist cork granules were poor insulators, but when waterproofed the presence of moisture had little effect on their heat cond. The waterproofing of cane hulls had little effect on their insulating value. Cotton cloth and flannel were little affected by moisture. If cotton cloth is waterproofed, the threads will not absorb the moisture and the air spaces between the threads are filled with moisture and the heat cond. will be altered.

H. E. Messmore

Compositions for coating the inside of barrels. E. Lehmann. *Seifensieder-Ztg.* 65, 770n–771(1938).

J. W. Perry

Phosphates, their role in detergency. J. M. Gillet. *Soap* 15, No. 1, 25–6, 60(1939).—Three types of phosphates find use in detergency, orthophosphates, pyrophosphates and metaphosphates. The first is a water softener. The pyrophosphates have a powerful peptizing action and a marked specific solvent action on certain gums and resins. The metaphosphates bind Ca and Mg in hard water in sol. form so that water can be made alk. and treated with soap so that no pptn. of any kind will occur.

E. Scherubel

Bactericidal (waxing and polishing) products for floors. Carl Lüdecke. *Seifensieder-Ztg.* 65, 667–8, 691–3, 711–12, 731–2, 751–2(1938).—This review is concerned principally with the prepn. of floor-wax compns. contg. antiseptics and the effectiveness of such compns. J. W. P.

Brake linings and other friction materials. H. E. Blank, Jr. *Automotive Ind.* 79, 346–53(1938).—The production of various types and methods of testing them are described. Suitable machines for testing automotive brake linings are shown. Graphs indicate the water and moisture reaction of ideal (theoretical) as well as excellent and poor (both com.) types of linings and also aging characteristics of these linings. The manufacturers of brake linings in the U. S. are listed. Leopold Scheflan

Domestic (German) raw materials used in conduit construction. Giese. *Papier-Fabr.* 36, Tech.-Wiss. Tl., 437–41(1938).—An illustrated descriptive article, discussing briefly advantages and disadvantages in the use of *asbestos, wood, paper, glass, porcelain, Al and synthetic resins* for piping. Louis E. Wise

Tanning of casein by aldehydes. P. P. Dyachenko and K. F. Shelpakova. *Colloid J.* (*U. S. S. R.*) 4, 337–43 (1938).—In NaOH solns. (p_H over 10.4) casein takes up 25 mg. of HCHO per g. The Na methylenecaseinate formed is pptd. by acetone and then swells to a gel in water. If the alk. soln. is pptd. by acid or the reaction between HCHO and casein takes place in a neutral or acid soln., 1 g. of casein takes up 12–15 mg. of HCHO. Analogous compds. are obtained from casein and acetaldehyde and acrolein. These compds. contain the group NHCH·RNH, which links together casein mols. and dets. the stability of the product. J. J. Bikerman

Specification for compound; sweeping. *New York City Specification* 6-C3:38T Tentative, Jan. 25, 1938. Board of Standardization, Dept. of Purchase, New York, N. Y.

L. Wilson Greene

Observations on statistics of old-house borer. K. Escherich. *Ann. Schädlingskunde* 14, 113–16(1938); cf. *C. A.* 33, 241⁷.—The accepted means of control of the old-house borer (*Hylotrupes bajulus L.*) are (1) *hot air*, (2) HCN fumigation and (3) treatment with liquid poisons. The general problem of control is reviewed. L. N. M.

Destruction of rats. H. W. Jack. *Agr. J. Fiji* 9, 2–4(1938).—Na_2HAsO_3 or $BaCO_3$ is generally used for rat poisons and some rats have been made of Zelio Paste, a proprietary prepn. contg. Tl sulfate. These poisons are used with baits and the Na_2HAsO_3 is most satisfactory. About 0.2 g. of the paste is necessary to kill a rat and when not *eaten* is claimed to make the rats sterile. Because of the danger little use is made of $Ca(CN)_2$ dust.

Phosphinic acids of aliphatic hydrocarbons, etc. (detergents and wetting agents) (U. S. pat. 2,137,792) 10. Esters of pine-wood pitch (in elec. insulating compns.) (U. S. pat. 2,138,193) 22. Amino alc. acrylates (*U. S.* pat. 2,138,031) 10.

Kausch, O.: Handbuch der künstlichen plastischen Massen. 2nd revised ed. Munich: J. F. Lehmanns Verlag. 584 pp. M. 21, bound M. 22.50.

Lanza, A. J.: Silicosis and Asbestosis. New York: Oxford Univ. Press. 439 pp. $4.25.

Mentsch, Otto: Leitfaden der Pathologie und Therapie der Kampfgasserkrankungen. 5th revised ed. Leipzig: G. Thieme. 140 pp. M. 10.80.

Netto, Giuliano: Appunti di chimica industriale dalle lezioni di G. N. svolte nell'anno accademico 1937–38. Turin: A. Viretto. 286 pp.

Rösner, Hermann: Chemische Fundgrube. Eine Auslese von 250 unbekannten chem. Patenten und Erfindung aus allen Ländern. Stuttgart: Franckh. 193 pp. M. 4.20.

Shell, John S.: Dental Materials. St. Louis, Mo.: C. V. Mosby Co. 413 pp. $4.50. Reviewed in *Metals & Alloys* 10, MA63(1939).

Stammer, Friedrich: Pflanzliches und tierisches Eiweiss. Seine Herstellung aus Magermilch, Pflanzensamen, Tierblut. *Berlin: Elsner Verlags.* 239 pp. M. 7.50.

Chemists' and Druggists' Year Book and Directory for Scotland, 1939. Edited by J. B. McVitie. Glasgow: *Munro & Co.* 320 pp. 2s. 6d. Reviewed in *Pharm. J.* 142, 11(1939).

Kempe's Engineer's Year-Book of Formulæ, Rules, Tables, Data and Memoranda for 1939. 45th annual issue revised under the direction of L. St. L. Pendred. London: Morgan Bros., Ltd. 1 £ 11s. 6d.

Determining the amount of gas in liquid or plastic materials such as those used in well drilling. Sylvan Cromer *and Irwin F. Bingham.* U. S. 2,138,141, Nov. 29. A method (suitable for detg. if a drilling mud is "gas cut") includes placing a sufficient quantity of the mixt. in a closed chamber normally substantially to fill the same, subjecting the mixt. to variations in vol.-pressure relationships and computing the percentage of compressible fluid in the chamber in accordance with known laws for the behavior of gaseous fluids, to obtain an indication of the presence of gaseous content in the mixt. and an indication of the amt. of gaseous fluid therein. App. is described.

Injection-molding device for thermoplastic materials such as cellulose acetate. Celluloid Corp. Brit. 492,-642, Sept. 23, 1938.

Mold materials. Josiah Robinson. Brit. 492,718, Sept. 26, 1938. Semipermanent molds and cores are made *wholly or in part from* aluminous hydraulic cement, contg. CaO 42, Al_2O_3 48 or over and SiO_2 less than 7%, mixed with graphite or other refractory form of C. The H_2O used *should* be insufficient to hydrate the cement wholly. The molds may be dried up to 600°.

Molded laminated products. Henry W. H. Warren *and Reginald Newbound* (to Canadian General Electric Co. Ltd.). Can. 376,832, Oct. 4, 1938. Sheets of paper, fabric, wood veneer, etc., are coated at room temp. with *liquid, solvent-free polymerizable* styrene contg. an oxidizing agent, e. g., benzoyl peroxide, in amt. (0.01–6.5%) sufficient to ensure polymerization of the styrene, and a *modifying agent*, e. g., tritolyl phosphate, in amt. sufficient to make the styrene nonelastic and less inflammable, and the coated surfaces heated and pressed simultaneously to polymerize the styrene in place and bond the surfaces together.

Phenol-formaldehyde molding powder. Ludwig Czerny (to Resinous Products & Chemical Co.). U. S. 2,137,-648, Nov. 22. A process of prepg. infusible, weldable molding powders comprises partially condensing a phenol with more than an equimol. proportion of CH_2O in an alk. medium, adding to the partial condensate a modifying agent which is one of the group consisting of amide-form-

weakened by NaClO, a tube is formed, the tube coated with cellulose viscose and substantially pure cellulose regenerated from the cellulose viscose. Cl. C. A. 32, 5998⁸.

Apparatus for making sausage casings by extruding a plastic fibrous composition through an annular nozzle. Naturin-Werk Becker & Co. (Oskar W. Becker, inventor). Ger. 667,203, Nov. 7, 1938 (Cl. 66b, 10).

Dextrose products. *International Patents Development Co.* Brit. 493,005, Sept. 30, 1938.—The H_2O of cryst. of dextrose hydrate is removed, e. g., by heating to 160–200°F., the material being then ground to give a soft nongritty powder which may be mixed with an edible fat and other desired ingredients to produce a food compn. Among examples, (1) a chocolate covering comprises hard vegetable butter or other fat, cocoa, dry skim milk, sucrose, the dextrose, salt and vanillin, and (2) a sandwich filling comprises soft butter, dry skim milk, sucrose, the dextrose, salt and vanillin.

Roasting coffee. Johannes Koenelt. Ger. 667,106, Nov. 5, 1938 (Cl. 53d, 1). Air in the roasting drum is displaced by CO_2 before the drum is heated, and during the roasting process a stream of CO_2 is passed through the drum until the max. roasting temp. has been attained.

Spice compositions. *Erich Pohl and Hans Schmalkuch.* Ger. 668,073, Nov. 25, 1938 (C. 53b, 1.01). A substitute for cinnamon is prepd. by absorbing a mixt. of cinnamic aldehyde and eugenol in a powd. carrier, e. g., ground bark or nut shells. The mixt. should contain 10–25 parts of cinnamic aldehyde per part of eugenol, and the proportion of the mixt. to the carrier should be about 1–4%. The mixt. may be taken as an alc. soln., the alc. being evapd. after the impregnation of the carrier.

Fodder. Wilibald Näher. Ger. 667,245, Nov. 7, 1938 (Cl. 53g, 4.01). See *Fr.* 828,089 (*C. A.* 33, 2851⁹).

Fodder. Richard Aurich. Ger. 668,272, Nov. 28, 1938 (Cl. 53g, 4.04). A description is given of a rotary disintegrating and mixing app. for producing a fodder compn. from green fodder, potatoes, turnips and cabbages, with or without dried fodder.

Fodder. Hans Fattinger. Ger. 668,311, Nov. 30, 1938 (Cl. 53g, 4.04). This corresponds to Austrian 151,672 (*C. A.* 32, 2244⁶), but includes sp. examples.

Continuous apparatus for producing fodder by compressing and drying potatoes and other vegetable products. Josef Ehm and Hans Herr. Ger. 667,148, Nov. 5, 1938 (Cl. 53g, 4.03).

13—CHEMICAL INDUSTRY AND *MISCELLANEOUS INDUSTRIAL PRODUCTS*

(PLASTICS, RESINOIDS, INSULATORS, ADHESIVES, ETC.)

HERMAN A. BRUSON

American chemical industry in 1938. Sidney D. Kirkpatrick. *Ind. Chemist* 15, 9–13(1939). E. H.

British chemical industry in 1938. Anon. *Ind. Chemist* 15, 4–8(1939). E. H.

Progress in the fine chemical industry during 1938. R. R. Bennett. *Ind. Chemist* 15, 18–20(1939). E. H.

Chemical research and its significance for the development of the chemical industry. S. Nauckhoff. *Ivr* 4, 124–37(1938).—An address. Ruth Bergren

The development of chemical industries in the South. E. Emmet Reid. *Mfrs.' Record* 108, No. 1, 42, 50(1939). Leopold Schellan

Index of Specifications Used by the Navy Department for Naval Stores and Material. July 1, 1938. Washington: U. S. Navy Dept. 76 pp. L. Wilson Greene

Production of modern war gases. II. Géza de Hoffmann. *Technika (Budapest)* 19, 364–70(1938); cf. *C. A.* 33, 1833⁹.—Summary of newest technology. S. S. de Finlay

Detection of several war gases. G. Heck. *Pester* 3, 40–1(1939).—Qual. tests are described for bromobenzyl cyanide (*PhCHBrCN*), chloroacetone, bromoacetone, bromomethyl Et ketone, lewisite (a mixt. of β-chlorovinyldichloroarsine, di(β-chlorovinyl)chloroarsine, and tri(β-chlorovinyl)arsine), ethyldichloroarsine and other arsines. A. L. Kibler

A method for the care of gas masks in storage. Hans Kreis. *Gasmaske* 10, 134–41(1938).—Detailed directions for care and storage of gas masks. A. L. Kibler

The Draeger alkali cartridge for oxygen breathing apparatus. Fritz Bangert. *Dräger-Hefte* No. 199, 3990–2 (1938); cf. *C. A.* 32, 6755⁸.—A new alkali, termed L45, has been substituted for the caustic alkali used in the older app., and this is claimed to have several advantages, the most important of which is related to the fact that the new material is less hygroscopic than the old. A. L. Kibler

Evaluation of dust filters. Herbert Friess. *Gasmaske* 10, 113–19(1938).—Methods of testing dust filters are described and expt. data are given for several types of filter material. A. L. Kibler

Blood disorders due to industrial chemicals. E. W. Baader. *Arch. Gewerbepath. Gewerbehyg.* 7, 507–68 (1937).—The reactions of the principal industrial chemicals with the various constituents of the blood are reviewed. R. C. P. A.

Fever produced by breathing metallic vapors (in workers in marine industry). (Occupational chronic intoxication by zinc.) Francesco Molfino. *Rass. med. applicata lavoro ind.* 9, 374–9(1938).—Workers exposed to fumes contg. zinc suffered from repeated attacks of fever; they also showed gastric symptoms; 2 of the 20 patients exam'd. showed glycosuria. E. S. G. Barron

The appearance and prevention of silicosis and asbestosis. Enrico C. Vigliani. *Rass. med. applicata lavoro ind.* 9, 397–94(1938).—A review. E. S. G. Barron

Metabolism of patients suffering from silicosis. A. Hilmer. *Arch. Gewerbepath. Gewerbehyg.* 8, 449–57 (1938); *Chimie & industrie* 40, 891.—Metabolism at rest and fasting was detd. on 37 patients suffering from silicosis, Knipping's app. being used. For most patients, the value was 10–15% above normal. Even in severe cases in which working capacity is reduced 50–60% by silicosis the value often remains between 100 and 110%. In most cases these high results are obtained after increased pulmonary ventilation. A. Papineau-Couture

Protein plastic from soybean products—plasticization of hardened protein material. George H. Brother and Leonard L. McKinney. *Ind. Eng. Chem.* 31, 84–7 (1939); cf. *C. A.* 33, 2667⁹.—Polyfunctional alcs. plasticize CH_2O-hardened soybean protein, while monohydric alcs., ketones, esters and oils are generally ineffective. Addn. of 20% $(CH_2OH)_2$ plasticizes the hardened protein sufficiently for molding, and also renders it slowly thermosetting. The water absorption of the protein is doubled by this amt. of glycol. Oleanolic acid and Al stearate reduce the water absorption of the protein glycol plastic. A. F. Shepard

The formation of a typical synthetic resin. A. G. Hovey. *Paint, Oil, Chem. Rev.* 100, No. 4, 8–11(1938).—Data regarding resin formation from theoretical proportions of glycerol and phthalic anhydride up to the gelation point are the same as Kienle and Hovey's (*C. A.* 23, 1287–8). The same resin after gelation is allowed to cure at 125°; loss in wt. increases from 0.23% in 18 hrs. to 5.50% in 2110 hrs. App. for measurement of swelling pressures is suggested as means of studying gel formation, structure and inertness. The same gel, exposed to solvent action, imbibed solvents readily (especially acetone) with marked increase of vol. and developed appreciable swelling pressures. E. J. C.

Tubes constructed of artificial resin. E. Palm. *Wärme* 61, 235–8(1938).—The chem., phys. and elec. properties of Mipolam (polyvinyl chloride-type resin) are tabulated and its applications discussed. Methods adopted for join-

ing symptoms of C_2H_4 poisoning had a decreased vitamin C content in the blood, which was more pronounced the more definite were the symptoms. Treatment with vitamin C prepns. greatly improved the condition of an affected worker. Rabbits treated with vitamin C showed greater resistance to C_2H_4 vapor than did normally fed animals. B. C. P. A.

The effects of benzine and benzene on the human organism. W. Kretschmer. *Umschau* 43, 233–4(1939). —A brief description of the patho-biological significance of these common industrial chemicals and discussion of the manner in which they interfere with body chemical functions. H. Kwart

Toxicology of dinitrotoluene and pathology in exposed workers. Courtois-Suffit. *Arch. maladies professionnelles* 1, 294–7(1939).—The principal toxic effect of dinitrotoluene results from the inhalation of its vapors. The rate of absorption in workers who are chronic alcoholics is greatly increased. The principal effect is on the nervous system and the blood. The author reviews his experience with this chemical in powder mills. William G. Fredrick

Affections due to organic mercury compounds. P. Koelsch. *Arch. Gewerbepath. Gewerbehyg.* 8, 113–16 (1937).—Org. Hg compounds such as are used for seed-dressings may, by const. handling, produce (*a*) affections of skin and upper respiratory tract due to the mech. action of the dust, (*b*) affections of the central nervous system due to absorption, coupled with local damage to the organs in which the compds. are decompd. and Hg is deposited. B. C. P. A.

The significance of chemical data in the pathology of mineralic producing pneumoconioses. A. Policard. *Arch. maladies professionnelles* 1, 473–88(1938).—A discussion of the significance of analytical data in the study of pneumoconiosis. 26 references. William G. Fredrick

A study of asbestosis in the asbestos textile industry. Waldemar C. Dreessen, J. M. Dallavalle, Thomas I. Edwards, J. W. Miller, R. R. Sayers, H. F. Easom and M. F. Trice. *U. S. Pub. Health Bull.* No. 241, 126 pp. (1938).—Medical examn. of 447 workers in 3 plants exposed to appreciable amts. of asbestos dust showed an estd. asbestosis incidence of 27.5%. Asbestosis rarely appears in workers exposed to less than 5 million particles per cu. ft. of asbestos dust (light field count). Above this value the incidence and severity of the disease is a function of dust concn. and exposure time. Symptoms, case histories, autopsy data, manufg. procedures and many illustrations are given. 70 references. William G. Fredrick

A simple respiratory protective device for industrial purposes. E. Eigenberger. *Chem.-Ztg.* 63, 238(1939).—A simple supplied-air type respirator with a fully transparent face piece is described and illustrated along with an electrically operated device for supplying it with fresh filtered air at a rate of 1–2 l./sec. William G. Fredrick

Personalized protection. Edward R. Granniss. *Ind. Eng. Chem.* 31, 664–72(1939).—A crit. discussion of personal protective equipment suitable for use in the chem. industry. Methods for using, maintaining and storing such devices as respirators, goggles, canister gas masks, protective clothing as well as indications for their use are given. William G. Fredrick

Plastic and synthetic materials. J. Jacobs. *Rev. gén. caoutchouc* 16, 130–6(1939).—A review and discussion dealing with the present-day meaning of plastics and some of the important derivs. of cellulose. C. C. Davis

Pigments, lakes and other coloring materials in plastics. J. H. Clewell and H. W. Paine. *Paint Varnish Production Mgr.* 18, 312–15(1938).—Methods of pigmentation of cellulose ester plastics and the choice of pigments therefor are discussed. B. C. P. A.

The investigation of the thermohydrolysis process of plant materials. M. N. Piungyanskaya and M. G. Gen. *Trudy Nauch.-Issledovatel. Lab. i Op. Stantsii Barkalaitu* 1937, 33–47; *Khim. Referat. Zhur.* 1, No. 7, 85(1938).—The dependence of the physicochem. properties of Barkalite on the autoclave conditions (with a pressure of 14, 12, 10, 8 and 6 atm.; the max. pressure kept for 1 hr.) and on the amt. and manner of the water added (with a 5 and 7 atm. pressure the added water for each variant was 50, 100, 150% of the abs. dry wt. of the raw material) was investigated. Analyses of the vapor phases and of the resulting products were performed for each case. All substances contained in the steam-gas mixt. obtained during the thermohydrolysis, in the dry powder obtained after the autoclave reaction, and in the steam-gas mixt. obtained after the pressure reaction were detd. Conclusions: CO_2 is the main gas component of both phases; no traces of CO, CH_4 or of any unsatd. hydrocarbons were found in the gas phase; the main component of the condensate was AcOH whose content was increased with an increase of the temp. and pressure; the amt. of lignin in the powder is increased; and the cellulose in the autoclave reaction process is only slightly decompd. W. R. Henn

The investigation of the physical factors in the pressure reaction of Barkalite powder. A. G. Natradze. *Trudy Nauch.-Issledovatel. Lab. i Op. Stantsii Barkalaitu* 1937, 61–79; *Khim. Referat. Zhur.* 1, No. 7, 85–6(1938).—Pine sawdust was used in most cases to investigate the influence of the size of the particles in the raw material and of the temp. and pressure on the plasticization process. The sawdust was treated thermohydrolytically at 7 atm. for 2 hrs. with an amt. of water equal to 150% of the abs. dry wt. The powder obtained was dried to a 6.95% moisture content, and was sifted through sieves having 289, 110, 72 and 48 meshes/sq. cm. The final distribution of the particles depends more on the properties of the initial material than on the applied pressure. The heat phenomena occurring during the compressing were studied in a specially constructed app. The substances investigated were either raw or autoclave-treated sawdust (pine, birch) and other materials (straw, rice husks, corn cobs). The autoclave conditions were: temp. 180°, pressure 10 atm., time 2 hrs. A specific pressure of 300 kg./sq. cm. was used. The raw sawdust was pressed at a temp. below or near the critical point of the exothermic reaction. The temp.-time diagrams for different places of the samples are represented in 8 diagrams. Two pictures of the app. used are given. W. R. H.

The influence of plasticizers and of softeners on the plastic properties of Barkalite. A. M. Bogdanov. *Trudy Nauch.-Issledovatel. Lab. i Op. Stantsii Barkalaitu* 1937, 110–35; *Khim. Referat. Zhur.* 1, No. 7, 85(1938).—A series of expts. was performed with pine sawdust to obtain Barkalite powder and to investigate the action on this powder of phenol, furfural, a mixt. of phenol and glucose, hexamethylenetetramine, H_2SO_4, H_3PO_4 and of wood and artificial resins. Powders which were acted upon under pressure and plasticized with phenol and with furfural showed less water and acid resistance in the final product. The phenol and glucose mixt. greatly increases the viscosity, permitting the manuf. of figured articles with fewer defects. A 0.3% H_2SO_4 soln. or a 0.9% H_3PO_4 soln. improves the mech. properties, and has a smaller water and acid resistance. Samples of articles made from the Barkalite powder prepd. in the presence of sedimental resin were compared with those made of the pure Barkalite powder. They showed worse mech. properties and a greater stability to water, to acids and to alkalies. The addn. of different resins produced products with different compns., some of which were suitable for insulating purposes. W. R. Henn

Mechanism of drying technical casein. V. D. Surkov. *Colloid J.* (U. S. S. R.) 4, 705–9(1938).—The rate of evapn. of H_2O from casein and of contraction of casein grains was detd. It is slightly increased by an air current. J. J. Bikerman

Silica aerogel—effect of variables on its thermal conductivity. J. F. White. *Ind. Eng. Chem.* 31, 827–31 (1939).—The structure, prepn. and previous data on the cond. of silica aerogel are reviewed. At higher temps. the material transmits radiation. The addn. of opacifying agents was investigated. Red transparent admixts., opaque nonreflective substances and materials exhibiting

load, the points obtained fall approx. on a straight line. If this line is extended to zero rate, it gives the "yield value," which is the max. load which, theoretically, would produce no movement of the plunger. Stickiness is measured by detg. the load required to withdraw a knife from the putty in a given time. H. M. Stark

An improved method for the determination of the screen residue in clay. C. A. Carlton. *Rubber Age* (N. Y.) 46, 275–6(1939).—A mixt. of clay (100 g.), aq. $Na_4P_2O_7$ (25 cc. of a soln. contg. 20 g. of $Na_4P_2O_7$ per 1000 cc.) and water (375 cc.) is stirred in a high-speed stirrer (Hamilton-Beach Model No. 26 or A. S. T. M. stirrer for Method D-422) for 7 min., poured onto a 325-mesh screen (previously wet) slowly with a stream of water, washed through and detd. in the customary way. By preliminary wetting of the clay and with a peptizing agent, time is saved, the results are more precise and can be duplicated by different labs., and the life of the screen is prolonged. C. C. Davis

Transparent foil. Julian Buchwic and Jan Sachs. *Przeglad Tech.* 77, 475–80(1938).—A review. E. A. A.

Physical-chemical properties of the elastic high-frequency waves. Physical catalyzers. Ultrafiltration and centrifugal ultrasound waves. N. Marinesco. *Génie civil* 113, 317–22(1938).—A review of recent investigations and their application in industry. Ann N. Hird

The use of sulfur dioxide. Wm. D. McNally. *Ind. Med.* 8, 234–8(1939).—SO_2 can be detected by odor in a concn. of 3–5 parts per million; 8–12 parts cause irritation of the throat and 20 parts irritation of the eyes and coughing. For prolonged exposure a max. of 10 parts may be withstood; for 0.5–1 hr. 50–100 parts and for short exposures 400–500 parts. Workmen become habituated to the inhalation of SO_2. No permanent injury follows long exposure to small concns. or sudden exposure to high concns. James C. Munch

Products made by sulfonating fats and (higher) alcohols and their use in cosmetic articles. H. Fiedler. *Fette u. Seifen* 46, 35–6(1939).—Formulas are discussed. J. W. Perry

Modern paint removers. Fritz Ohl. *Seifensieder-Ztg.* 65, 1031–3(1938).—Cellulose derivs. (e. g., nitrocellulose, methylcellulose, cellulose acetate or glycollate) or combinations of phenol resins and Al soaps are recommended as thickeners and evapn. retarders. Choice of proper solvents for use in removing various types of finishes is discussed at length. J. W. Perry

The efficacy of naphthalene, paradichlorobenzene and hexachloroethane as insecticides for the control of the clothes moth. Walter Frey. *Arb. physiol. angew. Entomol. Berlin-Dahlem* 6, 189–97(1939).—Lab. tests on clothes moths (*Tinea biselliella* Hummel) showed *p*-dichlorobenzene (I) to be much more toxic to moths, larvae and eggs than naphthalene (II) or hexachloroethane (III); the latter is less toxic than II, even though it vaporizes faster. The relative rates of vaporization are: II (balls) 0.226, II (flakes) 1, II (crystals) 1.03, III (crystals) 7.96, I (granular crystals) 16.6. I should be used for packing clothes in air-tight storage chests. If the material is to be stored for a long period of time II (balls) should be used in conjunction with I. W. G. R.

Preparations for repelling foraging animals. Walter Meyer. *Seifensieder-Ztg.* 66, 680–90, 712–13(1939).—Review of prepns. usable to prevent attacks of deer, rabbits, etc., upon shrubbery, etc. A. Guillaudeu

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Refractory concrete [heat-insulating agent] (Moyabe-vich) 20. Vapor pressure and accommodation coeffs. of 4 nonvolatile compds.—vapor pressure of tri-*m*-tolyl phosphate over polyvinyl chloride plastics (Verbeck, Marshall) 2. Electrodeposition of synthetic resins (Germant) 4. Tool steels for making molds (for pressing artificial masses) (Brisle) 9. Further notes on soybean oil and linseed oil [soybeans as source of moldable plastics] (Sieve) 26. Occurrence of asm. Pb resulting from use of [illegible] (Ref. Finck) 26. Ten years' [illegible] plants (Barthélémy) 23. Acrylic resins in safety glasses (Granda) 19.

Weidler, Hans-W.: Klinik der Lungenasbestose. Klinische, statistische und röntgenologische Ergebnisse aus Reihenuntersuchungen an Asbestarbeitern über Krankheitsbild und Verlauf der Asbestose. Leipzig: G. Thieme. 152 pp. M. 6.60. Reviewed in *J. Ind. Hyg. Toxicol.* 21, 319(1939).

Plastic masses. G. S. Petrov, A. G. Golubkova and V. K. Kozlova. Russ. 51,584, Aug. 31, 1937. Organic fillers are satd. with an aq.-alkaline soln. of urea-aldehydic resins, NH_4 salts of aromatic monobasic or dibasic acids and an excess of NH_3.

Synthetic plastic products. I. G. Farbenind. A.-G. (Rudolf Schröter and Wilhelm Becker, inventors). Ger. 676,062, May 24, 1939 (Cl. 39b, 4.03). Addn. to 675,401 (*C. A.* 33, 6545[1]). Practically odorless plastic products are obtained by the action of an alkali, alk. earth or NH_3 polysulfide on an acetal or mercaptal contg. at least 2 halogen atoms linked to different C atoms. Examples are given of the manuf. of products from, *inter alia*, formaldehyde bis(β-chloroethyl) acetal, butyraldehyde bis(β-chloroethyl) acetal and formaldehyde bis(β-chloroethyl) mercaptal.

Molding compositions. Roelf A. van Linge. Brit. 506,553, May 31, 1939. See Dutch 44,502 (*C. A.* 33, 3487[4]).

Urea-formaldehyde molding-powders. James M. Walter and Imperial Chemical Industries Ltd. Brit. 506,003, May 19, 1939. An ester of H_3PO_4 in which all the replaceable H atoms of the acid are replaced by equiv. radicals, other than Ph_3PO_4 and Me_3PO_4, is incorporated as accelerator during or after the production of molding powders of the urea-CH_2O type. Stabilizers, e. g., NH_4 carbonate or carbamate, may be incorporated. In examples, the sirup obtained by heating urea with CH_2O at pH 7.5–8.0 is incorporated with paper pulp, dried and ground with Zn stearate, cyclohexanol stearate and (1) Et_3PO_4, (2) Monastral Blue and Me_2EtPO_4 and (3) Cd yellow and tritolyl phosphate. In Brit. 506,004, May 19, 1939, Me_3PO_4 is added as accelerator to urea-CH_2O molding powders during or after their production.

Mold materials. René F. J. Ricard. Brit. 506,770, June 5, 1939. Material for making or coating molds and cores for casting Ni-Al-steel, stainless steel, Mn steel, bronze or other metal comprise foundry sand, graphite and hardenable synthetic resin, e. g., such as described in Brit. 499,397 (*C. A.* 33, 6330[6]), or alkyd resin, PhOH-CH_2O resin or urea resin.

Polished molded products of casein composition. Daniel Kasen. U. S. 2,168,127, Aug. 1. A method of producing a polished molded casein article comprises subjecting uncured casein material having a suitable water content for molding in a cool mold to the action of a polishing soln. (such as a 5–10% NaOH soln. or concd. H_2SO_4) capable of acting upon the uncured casein material to polish its surface, then heating the polished moldable casein material to render it plastic and subjecting it to pressure within a cool mold to mold the article while preserving the polished surface, the method being suitable for the production of articles such as sheets or rods.

Molding articles such as buttons, etc., from powdered horn meal, casein, blood, glass or the like. Heinrich Skolaude. U. S. 2,169,665, Aug. 15. Various details of app. and operation.

Phenolic resin molding compositions. Wm. E. Flood and Geo. B. Howells (to Catalin Corp. of America). U. S. 2,168,061, Aug. 8. A method of producing molding compns. comprises treating more than 1.5 mols of CH_2O with 1 mol of phenol in the presence of an alk. catalyst, rendering the mass slightly acid, dehydrating until the mass would gel on long-continued heating, mixing thereafter with a substantial proportion of melted novolak resin resulting from the reaction of approx. equal mol. proportions of phenol and CH_2O in the presence of an acid [illegible] substantially [illegible] and permitting the

CHEMICAL ABSTRACTS

Vol. 34 SEPTEMBER 20, 1940 No. 18

I—APPARATUS, PLANT EQUIPMENT AND UNIT OPERATIONS

W. L. BADGER

Microporous ebonite as a filtration medium. Evilova. *Bynll. Obozen Opyt. Lakokrasochnol Prom.* 1939, No. 6–7, 28.—Pure distd. water stops filtering through microporous ebonite. This is not due to swelling of ebonite but to electrically charging of water by the ebonite. D. A.

Electrostatic dust sampler as used in sampling lead fumes. Edgar C. Barnes. *Penns. Dept. Labor and Ind., Safe Practice Bull. No. 57*, 8 pp.(1939).—A portable electrostatic dust sampler is described. The ppts. unit consists of cylindrical Al electrodes. The power supply consists of an ignition coil, high-voltage rectifier tube, and condenser furnishing about 10,000 v. An efficiency of 99% is claimed. Earl H. Brown

Investigations with the super [electron] microscope. H. Kaiden. *Chem.-Ztg.* 64, 129–33(1940).—The construction of the electron microscope is described and illustrated and the technique of prepg. and observing specimens is presented. Photographs are reproduced of colloidal Au, various bacteria, tobacco mosaic virus, potato X virus and PbO smoke; also of asbestos and Thomas meal with respect to their role in producing silicosis. T. H. Donkelberger

A gas-detection apparatus for qualitative microchemistry. C. L. Wilson. *Analyst* 65, 407–8(1940).—The reaction vessel is a micro test tube connected to the testing chamber by a suitable glass arm. Cotton wool or glass wool is placed in this arm to retain spray before the evolved gas enters the testing chamber which is a piece of straight glass tubing. Inside this is a series of glass rings which just slide into the tubing and serve for holding the various test papers. The procedure is illustrated by the detn. of AsH_3 in the presence of H_2S. The latter is removed first by passing the gas through the requisite no. of papers impregnated with $Pb(OAc)_2$, as detd. by expt. A subsequent disk is impregnated with $AgNO_3$ + HNO_3 to serve for detecting AsH_3 after the H_2S has been removed. W. T. H.

The photoelectric automatic analyzer. V. A. Mikhailov. *Avtomatika i Telemekhanika* 1937, No. 3, 7–40; *Khim. Referat. Zhur.* 1938, No. 6, 116.—The app. described can be applied to automatic measurement of turbidity, color or residual Cl in water, to the automatic control of N oxides that absorb light in the visible region, to the automatic control of H-ion concn. (by use of colored indicators), and to the detn. of transparency in gaseous and liquid media. The app. possesses a stable photometric accuracy of measurement of ±1–2%, which is not affected by the aging of the photoelements or by variations of c. d. The measurements are entirely automatic. W. R. Henn

Apparatus for rapid determinations of arsenic in the presence of antimony. Valerije Bizkupski. *Bull. soc. chim. roy. Yougoslav.* 10, 75–9(in German, 79–80)(1939).—A distn. app. is described permitting quant. sepn. of $AsCl_3$ from $SbCl_3$ in the Fischer method (*Z. anal. chem.* 21, (1882)) of detn. of As and Sb by distg. between 70 and 100°. HCl is circulated through the app. at a const. rate to facilitate the distn., promote formation of As^{+++} and absorption of the gases. J. G. Tolpin

[illegible]'s triuclear colorimeter in ultramarine [illegible]. *Bynll. Obozen* fully applied in factory control of the quality of ultramarine. Six curves are given. David Aokony

An investigation of the comparative solubilities of typical acid-resisting materials in acids of various concentrations. L. N. Muravier. *Trudy Inst. Ogneuporov* 1937, No. 16, 82–96; *Khim. Referat. Zhur.* 1938, No. 6, 117–18.—Beshtaunite (SiO_2 71%, Al_2O_3 18% and Fe_2O_3 2%), acid-resistant bricks (SiO_2 59%, Al_2O_3 28% and Fe_2O_3 2% approx. 6%) and acid-resistant thin ceramic material (SiO_2 68%, Al_2O_3 33% and Fe_2O_3 2%) were examd. The samples were powdered, and 10-g. lots were treated for 10 days with 100 cc. of H_2SO_4 (d. 1.84), HCl (d. 1.19), HNO_3 (d. 1.40), 50% AcOH and 5 *N*, *N* and 0.1 *N* solns. of these acids and in solns. of tartaric acid of the same concns. The insol. residues were filtered off, washed, dried and heated to const. wt. The treatment of each sample was repeated 4 times, and the soly. detd. from the total loss of wt. A preliminary roasting lowered considerably the soly. of the substances in acids. The soly. of the acid-resistant brick was 2 to 7.8% in the various acids, that of beshtaunite 1.7–6.16%, that of the thin ceramic material 0.94–2.80%. In general the acid resistance increased with the increase of the Al_2O_3 content and with the decrease of the contents of Fe_2O_3, CaO and MgO. W. R. Henn

A new design of combustion-boat tongs. H. F. Priest. *Ind. Eng. Chem., Anal. Ed.* 12, 473(1940). C. G.

Power, capacity and efficiency of pumps. W. F. Schaphorst. *News Ed. (Am. Chem. Soc.)* 18, 658(1940).—A nomographic chart is given by which the relationships of horsepower, gal./min., head-feet, and pump efficiency (in percentage) are detd. easily. W. C. Ebaugh

A new regeneration process for absorption cooling plants. I. Radyikin. *Kholodil'naya Prom.* 16, No. 1, 13–18(1938); *Chem. Zentr.* 1938, II, 3844.—An arrangement is described in which regeneration takes place in the generator. The lower part of the app. is in the form of a bundle of tubes. The NH_3-rich soln. flows in a thin layer over these tubes; the vapor arising passes to a heat exchanger. The economic advantages of the arrangement are discussed. M. G. Moore

Graphical determination of heat-transfer coefficients for tube bundles. Josef Böhm. *Wärme* 62, 625–31 (1939); *Science Abstracts* B, 42, No. 501, 449; cf. *C. A.* 34, 4¹.—After a short description of the use of the principle of similitude for the detn. of heat-transfer coeffs., equations are derived for tube bundles subjected to either transverse or parallel fluid flow. The heat-transfer coeffs. are represented in terms of the customary dimensionless groups of variables Nu, Fe and Re, and nomograms are reproduced which enable points to be read off for various particular cases. Their use is illustrated by means of examples. C. L. S.

New thermoelectric pyrometers. B. Kinkulkin. *Sud* 8, No. 6, 15–19(1939); *Chem. Zentr.* 1940, II, 2064.—The most satisfactory combinations were found to be C-W and C^1-Mo. The C^1 and C^2 designate C electrodes prepd. in a particular manner. Al_2O_3 proved to be best for insulating the thermoelements. Temps. up to 1600° can be measured and 5–6 measurements can be made before the elements must be discarded. [illegible]

a sign of regeneration and is not specific. Together with other signs and under definite conditions it is a useful method for the recognition of Pb poisoning.

Dangers connected with the delivery of industrial poisons. Zimmermann. *Zentr. Gewerbehyg. Unfallverhüt.* 27, 101(1940).—A workman was showered with acid when the bottle of pickling acid (a mixt. of inorg. acids, mostly HNO_3), which he was carrying, exploded. He died of blood poisoning from mineral acid burns, exhaustion, severe kidney damage and double pneumonia 12 days after the accident. The explosion may have been caused either by the interaction of the acid with residues of unknown nature in the bottle which may have had a fine, scarcely visible crack or, more probably, by the formation of NO_2 from the interaction of the acid with particles of rubber from the stopper. Ruth Berggren

Medical investigation on the subterranean black-marble quarries. Langelez and Uytdenhoef. *Ber. 8 intern. Kongr. Unfallmed. u. Berufskrankh.* 2, 989(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 40(1940).—Both the marble and the adjacent stone were entirely free from silicic acid. Work in the black-marble quarries entails no danger from silicosis. Ruth Berggren

Some investigations in the slate quarries. Observations on the lungs of slate workers. A. Feil. *Ber. 8 intern. Kongr. Unfallmed. u. Berufskrankh.* 2, 986(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 40(1940).—The French slate contains 84% combined silicates (alumina, lime, Mg, potash, etc.) and only 6–7% silicic acid. Examn. of 251 slate workers who had been exposed to the dust under varying hygienic conditions revealed no signs of silicosis. The tendency to emphysema and chronic bronchitis is increased. Since the slate contains much sericite, these findings do not indicate that sericite is the chief cause of silicosis. In spite of the relative harmlessness of the dust, prophylactic measures are necessary. Ruth Berggren

Asbestosis. A. Wolff. *Nord. Hyg. Tid.* 21, 1, 33(1940) (in Norwegian); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 193–4(1940).—Three cases are described of asbestosis which occurred in Norway in factories where asbestos was used as packing material for acid containers. In one case asbestos particles were present in the expectoration. This disease has not hitherto been observed in Scandinavia. Ruth Berggren

An important raw material for chemical industry: skim milk. G. Genin. *Industrie chimique* 27, 10–14(1940).—Skim milk contains considerable quantities of casein, lactose, lactalbumin and riboflavin. The industrial uses of casein in the preparation of (1) artificial wool or textile fibers, (2) plastics and (3) films are reviewed. 86 references. G. W. Ayers

Plastics from bagasse and other agricultural residues. S. I. Aronovsky and T. F. Clark. *Mfrs. Record* 110, No. 3, 22–5, 59(1941).—Acid and alk. digestions are discussed and plastic-manufg. operations are described. Tabulations show the av. of certain phys. characteristics of plastics from sugar-cane bagasse, production data and proximate analyses of certain agricultural by-products (various straws, hulls, etc.), and the estd. cost of raw materials for the production of bagasse molding powders. Leopold Scheflan

Films and plastics from starch. J. Seiberlich. *Modern Plastics* 18, No. 7, 64–5, 98(1941).—A report and discussion, with reference to several patents, of the progress made to date on the utilization of starch as the raw material for the manuf. of plastics. Harris Beck

Influence of synthetic rubbers on plastics—widening the commercial field. Harry Barron. *Chem. Age* (London) 44, 107–9(1941); cf. *C. A.* 35, 1667⁹.—A review and discussion of the com. importance of copolymerization of bivinyl derivs. in the development of synthetic-rubber compds. Harris Beck

New mica-resin molding compounds developed by TVA. Lynn L. McMurray. *Modern Plastics* 18, No. 7, 61–3, 98(1941).—Mica obtained from schist ore by the froth flotation process has inherently higher dielec. strength than ground mica scrap. This beneficiated mica, ground fine for best flow and elec. properties, was incorporated as filler in phenolic-resin molding powders by dry-mixing in a pebble mill. Proportions up to 80% mica gave best elec. properties, but a 70% compn. was used because of its desirable mold flow. The resulting compn. when molded under 2000 lb. per sq. in. pressure at 160° to 160° was characterized by high dielec. strength, and good resistance to corrosive acids and to water absorption. Addns. of higher percentages of schist mica to phenolic resins did not reduce the power losses. Harris Beck

Synthetics. C. P. Kidder. *Mech. Eng.* 63, 287–93 (1941).—A review, with 12 references, on synthetic rubberlike substances, nylon, Cordura rayon for tires, chromated zinc chlorides for wood preservation, and Lucite. E. H.

Methacrylic resins. I. Polymerization of methyl methacrylate. R. Inoue. *J. Soc. Chem. Ind., Japan* 43, Suppl. binding 448–9(1940)(in English).—The rate of polymerization accelerates, reaches a max. and then decreases continuously. The apparent heat of activation was found to be 12.5 Cal. The degrees of polymerization of the polymers formed at various stages are almost equal. Saverio Zuffanti

Studies on urea-formaldehyde resins. I. Composition of powdery resins. S. Tsuruta. *J. Soc. Chem. Ind., Japan* 43, Suppl. binding 366–9(1940)(in English).—Twenty-seven kinds of resin were prepd. by (*a*) varying the amt. of aldehyde of the same concn. and of different concns. (37.2%, 36.0%, 39.4%) added to a const. amt. of urea (45 g. of 50% soln.), and (*b*) by varying the temp., 30°, 50°, 70° and 90°. In each case 0.2 cc. of 0.2 *N* HCl was used as a catalyst. The compn. of the resins showed systematic though not simple changes. In each group the compn. changes continuously; this shows the existence of homologous series. The continuous formula of the condensation type like (I) and (II) is more general than the discontinuous one of the polymerization-condensation type like (III) and (IV).

$$H(NHCONHCH_2)_nNHCONH_2 \quad (I)$$

$$H[N(CH_2OH)CONHCH_2]_nNHCONH_2 \quad (II)$$

$$[H_2NCON:CH_2]_n \quad (III)$$

$$[H_2NCON\begin{matrix}CH_2\\CH_2OCH_2\end{matrix}NCONH_2]_n \quad (IV)$$

Saverio Zuffanti

Urea-formaldehyde film-forming compositions. Air-drying films by acid catalysis. T. S. Hodgins and A. G. Hovey. *Ind. Eng. Chem.* 33, 512–15(1941).—The action of mono- and diphosphoric esters of alcs. in catalyzing the hardening of urea-formaldehyde films has been investigated. These esters are of value in hardening urea-phenol-formaldehyde resins and may be used with melamine-formaldehyde-butanol resins where package stability is not a major factor. A 0.004-in. urea-formaldehyde film, on air-drying, was soft at 4 hrs. and had a Sward hardness of 20 at 24 hrs. With a short-chain alc. phosphate accelerator present to the extent of 1–5%, this film had Sward hardnesses of 44–52 at 4 hrs. and 48–60 at 24 hrs. Precautions to be observed in the formulation of air-drying enamels contg. acidic accelerators are discussed. Frank C. Croxton

Testing the insulating properties of thermos flasks. R. Vorbau. *Chem. Appp.* 27, 258(1940).—A method of testing thermos flasks immediately after manuf. is described, wherein a thermocouple is inserted and the cooling rate inside the flask is measured. G. W. S.

Melanoderma and keratoses from the action of high-boiling hydrocarbons. H. Wanick. *Arztl. Sachverst. Ztg.* 46, 49(1940); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 201 (1940).—In the prepn. of cork plates (heat-insulation plates of asphalt and cork) much dust develops under very unfavorable working conditions. Two workers, who had been working for 3 months, suffered from pigmentation, inflammatory changes and hyperkeratoses of the face, forearms and hands. The hyperplastic processes were

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

(PLASTICS, RESINOIDS, INSULATORS, ADHESIVES, ETC.)

HERMAN A. BRUSON

Mines safety and accident prevention. X. Suggestions *for reducing accidents.* Robert Boone. *Mines Mag.* (Colo. School of Mines) 31, 122, 134, 136, 141 (1941); cf. *C. A.* 35, 2007.—*Descriptive.* L. S.

Adequate medical facilities for control of lead absorption. Elston L. Belknap. *Natl. Battery Mfrs. Assoc., Rept. Ind. Hyg. Sessions* 13, Pt. 2, 65–70(1939); cf. *C. A.* 35, 821[1].—Potentially dangerous industrial exposure to lead *develops* when inhalation of finely divided lead compds. occurs in excess of 1.5 to 2 mg. of lead per 10 cu. m. of air. The commonest signs of lead absorption are a lead line, stippled cells in the blood and lead in the urine (0.1–0.2 mg. per liter). Very frequent medical examination of lead workers is recommended. A. L. Elder

Growths in the respiratory tract. (Preliminary notice.) *A. f. Amor., Ent. f. intern. Kongr. Unfallmed. u. Berufskrankh.* 2, 941(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 33(1940).—*Five regions of the respiratory tract are especially sensitive to the action of inhaled vapors and dust:* (1) the anterior end of the *middle turbinated bone,* (2) the portion of the septum opposite (1), (3) the nasopharynx, (4) the larynx and (5) the cavina and the entrance to the principal bronchi. *The mucous membrane* of the respiratory tract is frequently irritated by dust, Cl and SO_2, which cause an epithelial metaplasia. The harmful action of chromic acid and As and Cu salts on the nose causes *chronic inflammatory changes,* and ulcerations and perforations of the septum. The perforations usually appear in region (2). *Each of these substances is an* etiological factor in the development of growths of the respiratory tract. Two types of occupational cancer of the lungs are described in the literature: (a) The Schneeberg miners, who suffer from tumors, work with ores contg. Ag, Ni, Co, Bi, As and Ra, which renders the air highly radioactive; As is a known cancerigenic agent and Ra is often considered one. *Carcinoma can* be produced experimentally with K arsenide. (b) Those who work with chromates, especially with *their purification,* are also *subject* to malignant growths of the lungs. The tumors particularly considered in this work are those *found in workers* engaged in the prepn. of $CuSO_4$ and in Ni refining. The ore contains Cu, Ni, Co, S and noble metals of the *Pt group.* The Cu is extd. with H_2SO_4 contg. As. The metallic residues which contain Cu and up to 4% As are ground and calcined. *The dust contains* Cu arsenide which is continuously inhaled. The air also contains definite amts. of SO_2 and SO_3. The tumors in *these workers were all in* the ethmoid region. Only 1 case of carcinoma of the nasopharynx and none of the larynx were found. *The age of* the patients, the period of exposure to the danger and the av. age at death were similar to those in the Schneeberg *lung carcinoma and in* cancer of the bladder in workers on aniline dyes. Suitable changes with the elimination of As were *undertaken; it is assumed* that these diseases will disappear in the future. Ruth Berggren

Occupational *lung cancer.* L. Teleky. *Acta Unio Intern. contra Cancrum* (Paris) 3, 253(1938); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 33(1940).—*A very detailed and crit. work on occupational injuries which can lead to lung carcinoma.* Diagnosis has changed during the last decades; silicosis is found today where formerly pulmonary tuberculosis would have been the diagnosis; approx. *three-fourths of the miners in Joachimsthal now die of lung cancer where earlier, the existence of lung cancer was disregarded.* Scepticism is urged concerning the assertion that lung cancer is increasing. A crit. evaluation of numerous *studies on silicosis and cancer reveals no frequent coincidence of lung cancer and severe pneumoconiosis; i. e., there is no evidence that pneumoconiosis predisposes to lung cancer.* Although it is theoretically possible that *cancer can develop from the scar produced by dust injury* [illegible] mucous membrane, there is no practical basis *for the development of lung cancer from pneumoconiosis in general or silicosis in particular.* It is highly probably, however, that asbestosis *predisposes to the development of cancer* (6 cases of lung carcinoma in 29 published autopsies on asbestosis). *The irritant action of asbestos dust may be purely mech.* in contrast to the chem. action of quartz dust. Chromate dust also appears to *stimulate the development of cancer of the lungs and perhaps also of other organs.* The inhalation of producer gas (contains 0.7% *tar vapor*) has caused several cases of lung cancer in Japan. The no. of observations is yet too small to permit any conclusions. *Skin cancer is frequently* found in workers exposed to tar dust, pitch dust and tar vapors, but no lung carcinoma has yet been found in such workers. Exhaust gases from motor vehicles contain no substance which has yet been shown to favor the development of cancer. *Isolated observations* on lung cancer in the As, Ni and Fe oxide industries stimulate further work but do not yet permit any conclusions. *However, the* cancerogenic action of radioactive substances, especially the Ra emanation (Schneeberg, Joachimsthal) *is certain.* This injurious action requires years, usually decades, before lung cancer occurs; the cancer often does not develop until years after removal of the harmful action. A true cancer always develops. Ruth Berggren

Lung cancer and occupation. Koelsch. *Acta Unio Intern. contra Cancrum* (Paris) 3, 243(1938); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 32–3(1940).—*Practically,* dust inhalation alone cannot be recognized as a significant cause of lung carcinoma, in spite of the assumed *anatomical possibility.* The acute and chronic action of irritants (acid industry) and war gases might in very rare cases cause *bronchial cancer.* The occurrence of lung cancer in asbestos workers (12 cases to date) must be studied further. Chromate workers *are in specific danger* of lung cancer. The question of the harmful effects of tar and the action of tobacco smoke *has not yet been fully investigated.* In England 14 cases of lung cancer and 16 of cancer of the accessory nasal cavities have been observed *among workers* on Ni ores. The action of Ra emanation is the cause of lung cancer in the miners of Joachimsthal and Schneeberg. *Prophylactic measures* are briefly discussed. Ruth Berggren

Chromate lung cancer. W. Ahrens and W. Jonas. *Acta Unio Intern. contra Cancrum* (Paris) 3, 103(1938); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 32(1940).—*A report* on recently established cases of lung cancer in chromate workers, most of whom had long since left the *industry.* The *latency* period was very long (about 30 years). Chem. investigation revealed a distinct storage of chromates in the *lung tissue.* The chronic injury of the nasopharynx (almost all had perforations of the septum) through the continuous irritation of the *chromates* and other industrial products was a particularly marked factor. The kiln glands were always enlarged. *Prophylaxis is of prime importance* in the control of chromate lung cancer. Ruth Berggren

Chemistry in national defense. Edward R. Weidlein. *News Ed. (Am. Chem. Soc.)* 19, 453–6(1941).—National *problems and the program* of the Chemicals, Drugs and Allied Products Section of the Office of Production Management are presented. Defense calls for trained men in the chem. industries and in universities, so they should not be *withdrawn from their present positions* except when such action is necessary for chem. work in the military service. *Civilian as well as military needs* are given consideration, but the latter take precedence. Problems confronting us now are *minor as compared with conditions in* 1917. Cooperation with the Army and Navy Munitions Boards, Council of National Defense, *the Office of Administrator* of Export Control and the Office of Production Management is stressed. *An illustration of the work done*

Brooks and A. T. Coombe. *Ibid.* 1013–1022. Natural gas. P. S. Lott and G. R. Hopkins. *Ibid.* 1023–64. Natural gasoline and liquefied petroleum gases. G. R. Hopkins and A. T. Coombe. *Ibid.* 1065–80. Carbon black. G. R. Hopkins and H. Backus. *Ibid.* 1081–8. Helium. R. A. Cattell and C. W. Seibel. *Ibid.* 1089–92. Asphalt and related bituminous. A. E. Redfield. *Ibid.* 1093–1104. Cement. Oliver Bowles and E. V. Baker. *Ibid.* 1105–36. Stone. *Oliver Bowles and M. S. Jensen. Ibid.* 1137–70. Slate. *Ibid.* 1171–8. Sand and gravel. Duncan McConnell and C. E. Tucker. *Ibid.* 1179–96. Gypsum. Forrest T. Mayer. *Ibid.* 1197–1206. Lime. Duncan McConnell and A. T. Coons. *Ibid.* 1207–22. Clays. Paul M. Tyler and A. Lion. *Ibid.* 1223–38. Abrasive materials. Robert W. Metcalf. *Ibid.* 1239–54. Feldspar. *Ibid.* 1313–22. Sulfur and pyrites. Robert H. Ridgway, Allan F. Matthews and A. W. Mitchell. *Ibid.* 1255–68. Phosphate rock. Bertrand L. Johnson and K. G. Warner. *Ibid.* 1269–84. Talc, pyrophyllite and ground soapstone. *Ibid.* 1285–94. Barite, witherite and barium chemicals. *Ibid.* 1333–42. Fluorspar and cryolite. H. W. Davis and M. E. Trought. *Ibid.* 1295–1312. Asbestos. Oliver Bowles and K. G. Warner. *Ibid.* 1323–32. Potash. J. H. Hedges. *Ibid.* 1343–56. Mica. Paul M. Tyler and K. G. Warner. *Ibid.* 1357–68. Salt. A. T. Coons and F. E. Harris. *Ibid.* 1369–80. Magnesium compounds and miscellaneous salines. Alvin H. Schallis and A. T. Coons. *Ibid.* 1381–98. Gem stones. Sidney H. Ball. *Ibid.* 1399–1410. Mineral economics. Paul M. Tyler and Leo J. O'Neill. *Ibid.* 1411–24. G. G.

Recent developments at Shawinigan Chemicals, Ltd. G. O. Morrison. *Chemistry & Industry* 1941, 397–402.—*Acetone* is made by direct action of steam and C_2H_2 as follows: $2C_2H_2 + 3H_2O \rightarrow CH_3COCH_3 + CO_2 + 2H_2$. The reaction mixt. is passed over a ZnO-iron oxide catalyst carried in reaction tubes which are held at a controlled elevated temp. by means of a molten salt bath. *Vinyl resin* development is described. *Ethylidene diacetate* is produced by combining C_2H_2 with *AcOH* in the presence of a Hg catalyst. The crude ethylidene diacetate, after neps. and distn., is decomposed to give *acetic anhydride* and CH_3CHO. A small amt. of *vinyl acetate* neps. when ethylidene diacetate is distd. The various factors controlling the process, such as temp., circulation rate or catalyst, were studied and led to a process which gave yields of 80% vinyl acetate. This furnishes the base for such vinyl resins as *polyvinyl acetates*, hydrolysis products of polyvinyl acetates and *polyvinyl acetals*. The methods of production, properties and uses of the various resins manufd. in these classes are described. H. Sweetz

The measurement of the "firmness" of soft materials in industrial use. G. W. Scott Blair and P. M. V. Coppen. *J. Soc. Chem. Ind.* 60, 190–6(1941); cf. *C. A.* 34, 3119⁸.—Test cylinders of industrial materials of different types are subjected to loads increasing at a rate proportional to the change in cross section of the test piece and the deformations are directly plotted on a chart driven by a synchronous motor. Log strain/log time curves of these materials are linear with very few exceptions in spite of the fact that the materials differ in viscosity, compression or shear moduli. The flow properties of a considerable no. of materials can be described by the elastic recovery, as well as by log ψ and k of the equation $\psi = St^{n}k$ (Scott Blair and Coppen, *Proc. Roy. Soc.* (London) B129, 100 (1939)) where S = shearing stress, k = shear, t = time and ψ and k are consts. These 3 factors are nearly independent of stress and strain conditions. In a few cases the introduction of the stress exponent s of Nutting's equation $\epsilon = St^{n}\sigma^{s}$ (written in the authors' notation) is necessary. Nutting's equation (*Proc. Am. Soc. Testing Materials* 21, 1162(1921)) which comprises the equation of Scott Blair and Coppen as a special case is discussed with respect to the relation of stress, strain and time in soft materials and the applicability of the equation of the authors to the [illegible] measurement of rheological properties Hans Schindler

its medical control. John H. Foulger and Alma J. Fleming. *J. Am. Med. Assoc.* 117, 831–6(1941).—The method depends upon proper scoring of data on systolic and diastolic and pulse pressure. S. Margulis

Occupational injuries. R. P. Ferrari. *Med. Clin.* 36, 1005–7(1940).—A review is included of recent work in the Italian literature on dangers to the health of electrowelders and their prevention, asbestosis, silicosis, changes in the upper air passages produced by electron dust, anaphylactic asthma in a rayon factory, eczema *dimense*, nasal injuries produced by Cr, chronic Mn poisoning, Pb in the blood, urine and feces of normal persons and in Pb poisoning, toxicity of Hg vapors, *fatal* poisoning from Pb tetraethyl, methemoglobinemia after cleaning metal filters impregnated with rubber with warm nitrobenzene, blood diseases from the chronic action of benzene and poisoning in printing establishments from the action of the fumes of a mixt. of benzene and xylene used in cleaning. R. Bergren

Industrial dermatitis. Harry R. Foerster. *Wisconsin Med. J.* 40, 377–82(1941); cf. *C. A.* 35, 2908⁸, 3559⁶; 34, 5059⁸.—An address. Ruth Berggren

The prevention of benzene poisoning. P. Emile Weil. *Bull. mém. soc. méd. hôp. Paris* 56, 233–6(1940); cf. *C. A.* 35, 2938⁶; 35, 0347⁸.—The incidence of benzene poisoning has increased, owing chiefly to war industries. The recent decree which requires medical exams. before hiring workers, medical visits every 2 months supplemented by hematological exams. (red cells, hemoglobin, white cells, leucocytic formula), the posting of the dangers of benzene poisoning and the precautions which should be taken to prevent the poisoning and to avoid a return of the symptoms, should be amended as follows: (a) The workers must be given anatomic-clinical exams., varying with the case. These should be made by competent persons at contract prices not too burdensome for the industrial budgets. (b) At the slightest sign of failure of the hematopoietic system, prolonged leave of absence should be granted until there is complete restoration of the blood and bone marrow. (c) *Rotation* among the workers should be practiced in all industries where it is possible. Much less poisoning and fewer severe or fatal cases are noted in trades subject to work stoppage or dull seasons. Where substitution is possible, the use of benzene as a rubber solvent should be suppressed. Ruth Berggren

Recovery following exposure to benzene. Leonard J. Goldwater and Margaret P. Tewksbury. *J. Ind. Hyg. Toxicol.* 23, 217–31(1941).—See *C. A.* 35, 2709⁸. A. L. Elder

Butane injuries. F. A. Page. *Safety Eng.* 82, No. 1, 13–14(1941).—Precautions to be used in handling butane are reviewed. Ann Nicholson Hird

Carbon monoxide in industry. Richard W. Lurer. *Hahnemannian Monthly* 76, 781–91(1941).—A discussion of the toxic action of CO, and means for its control in industry. Joseph S. Hepburn

Assay office dust control at Wright-Hargreaves Mines, Limited. G. Brabon Ferrel. *Trans. Can. Inst. Mining Met.* 44 (*in Can. Mining Met. Bull. No. 353*), 423–34 (1941). Aileen H. Emery

Underground crusher dust control at Lake Shore Mine. O. E. Andrew. *Trans. Can. Inst. Mining Met.* 44 (*in Can. Mining Met. Bull. No. 353*), 413–22(1941). Aileen H. Emery

Synthetic substances. Zoltán Cséfalvay. *Technika* (Budapest) 22, 183–90, 205–11(1941).—A general account of synthetic resins, proteins, and other artificial substances and their present production. S. S. de Finsky

Introduction to the chemistry of artificial materials. [illegible] W. Schneider. *Chem.-Ztg.* 65, No. 24, 367–8; No. 25, 345–9(1940); 64, No. 1, 2–4; No. 3, 103–4 (in *Gummi-Ztg.* 54, Nos. 47 and 51, 55, Nos. 1 and 6)(1941); cf. *C. A.* 35, 1561⁸. E. J. C.

Introduction to the chemistry of artificial materials. VII–X. W. Schneider. *Kunststoffe-Ber.* 41, No. 4, 105–6; No. 5, 277–8; No. 6, 355–7; No. 7, 430–3(in *Gummi-Ztg.* 55, Nos. 9, 13, 17 and 23)(1941); cf. preceding abstract. C. C. Davis

Synthetic products made of wood. Raoul Baker.

many diseased states it remains substantially the same as in normal serum. L. E. G.

Chemiluminescence of sleeptonuric urines. Lyon D. Abbott, Jr. *Proc. Soc. Exptl. Biol. Med.* 49, 14–15 (1942).—Alkaptonuric urines, as well as solns. of homogentisic acid and Pb homogentisate, give off light when made alk. with NaOH and shaken with air. L. E. G.

Intravenous administration of bovine serum albumin as a blood substitute in experimental secondary shock. Harry A. Davis and A. C. Eaton. *Proc. Soc. Exptl. Biol. Med.* 49, 20–2(1942).—Bovine serum and plasma and bovine serum globulin are very toxic when injected intravenously into dogs. The toxicity of the whole serum or plasma seems to be due to the globulin or one of its related fractions. Bovine serum albumin is harmless when injected and is effective in raising and maintaining the blood pressure of dogs after severe hemorrhage. L. E. G.

Effect of renal and systemic bloods from normotensive and renal hypertensive dogs on arterial rings. M. R. Salk and G. E. Wakerlin. *Proc. Soc. Exptl. Biol. Med.* 49, 22–4(1942).—The vasoconstricting effects of heparinized renal vein and femoral artery bloods from 3 dogs before and after production of renal (Goldblatt) hypertension were studied on arterial segments from mesenteric arteries of bovines. No significant differences were found. L. E. Gilson

Changes in anticryptic power of the blood associated with anaphylaxis in guinea pigs. Kenneth L. Burdon. *Proc. Soc. Exptl. Biol. Med.* 49, 24–7(1942).—Preliminary. L. E. Gilson

Encephalitis virus antibody in serums of experimentally infected animals by agglutination of virus-coated cells. E. C. Roberts and L. R. Jones. *Proc. Soc. Exptl. Biol. Med.* 49, 52–4(1942); cf. *C. A.* 35, 4831[8], 5177[8].—Preliminary. L. E. Gilson

Experimental necrotizing arteritis. II. Mercuric chloride as effective as uranium nitrate in its production. Russell L. Holman and Willard C. Hewitt. *Proc. Soc. Exptl. Biol. Med.* 49, 58–62(1942); cf. *C. A.* 35, 6989[1].—$HgCl_2$ produced the same effects as U nitrate when used as previously described. L. E. Gilson

Experimental atherosclerosis and soybean lecithin. Homer D. Kesten and Ruth Silbowitz. *Proc. Soc. Exptl. Biol. Med.* 49, 71–3(1942).—Feeding soybean lecithin to rabbits receiving cholesterol restricts hypercholesterolemia and diminishes arteriosclerosis. L. E. Gilson

Electrophoretic identification of antibody to tuberculin protein. Florence B. Seibert and J. Walter Nelson. *Proc. Soc. Exptl. Biol. Med.* 49, 77–80(1942).—Antibody to tuberculin protein was identified in serum as a component with an electrophoretic motility close to α-globulin. This component increases in serum following sensitization to the protein, and is removed in part with the specific ppt. produced by adding antigen to the immune serum. L. E. Gilson

Characterization of milk influence in spontaneous mammary carcinoma [in mice]. Maurice H. Visscher, Robert C. Green, John J. Bittner, Zelda B. Ball and Heinz A. Siebentopf. *Proc. Soc. Exptl. Biol. Med.* 49, 81–6(1942); cf. *C. A.* 36, 150[8].—Preliminary. The active carcinogenic agent or agents in the lactating breast from high-cancer mice appear to be concd. in a fraction obtained by ultracentrifugation of homogenized tissue. This fraction is virtually free of matter above colloidal dimensions and contains a large share of the sol. material of high mol. wt. L. E. Gibson

Pancreatic calculi. Mangaldas J. Shah. *Indian Med. Gaz.* 76, 556–9(1941).—A clinical report is given of 2 cases. There were no symptoms typical of this disease alone, except the radiological findings. Glycosuria and hyperglycemia were present as well as increased and undigested fat in the stools. Helen Lee Grenfell

The effect of chlorination on the production of immunity and the immunobiological stability of the organism. G. A. Jonkin and M. N. Khanin. *Vestnik Mikrobiol. Epidemiol. Parazitol.* 18, No. 3–4, 254–65[in French, 265](1939).—The method of sp. immunization of an organism and the production of immune bodies (agglutinins, precipitins, hemolysins) under the influence of Cl were investigated. Therapeutic doses of Cl were used for the expts. (1:200,000). Chlorine-treated rabbits immunized with anti-diphtheria toxin produced a higher titer of agglutinins and precipitins than did the control rabbits; in rabbits immunized with sheep erythrocytes considerably smaller differences between the control and chlorine-treated animals were obtained. Chlorine treatment had no appreciable effect on the production of hemolysins. The absence of any changes in the titer of the hemolysins during chlorine treatment indicates the probable existence of a different reactivity of individual physiol. systems of an organism to the same action. The immunobiol. stability of guinea pigs against diphtheria toxin under the influence of chlorine changed very little during immunization with anatoxin and without immunization. Fourteen references. W. R. Hess

The content of bromine in blood during the various phases of tuberculosis in children. E. M. Mondial, *Pediatria* (Rio.) 48, No. 5, 320–3(1940).—The blood content of bromine was found to be normal in the initial stages of bone and pulmonary tuberculosis. However, in tuberculosis of the large serous, pleural and peritoneal membranes the amt. of Br is always high when the process is of an exudative type. It is normal in the active type. To judge from the data, of excess of Br in exudative tuberculosis of the pleura and peritoneum it is believed that concomitant disturbances are related to the chlorine metabolism. R. P. E. Hopf

Lung cancer due to asbestos dust in animal experiments. Morris Nordmann and Adolf Sorge. *Z. Krebsforsch.* 51, 308–32(1941).—When 240 white mice were exposed to asbestos dust for a total of 67–89 hrs. over a 6-week period or for a total of 72 hrs. over a 13-week period, 63 survived for examn. 21 weeks later. Of these 61, 20% showed a keratinized multicentric squamous epithelial lung carcinoma and 42–57% showed epithelial lung neoplasms in all stages. This finding supports the authors' view that asbestos dust may cause primary lung carcinoma in workers. Marion Horn

Observations on the blood of rats with implanted Jensen sarcoma. Hans v. Euler and Inga Pettersson. *Z. Krebsforsch.* 51, 326–8(1941).—The abnormally high pyruvic acid content of the blood of rats with implanted Jensen sarcoma (av. 50 γ/cc. as contrasted with the normal 12 γ/cc.) is considerably reduced (to 20 γ/cc.) within a few hrs. after injection of 1 mg. nicotinamide. The pyruvic acid content, however, does not drop completely to normal even if as much as 4 mg. nicotinamide is given. An action similar to that of nicotinamide is exhibited by cozymase, insulin and adenosinetriphosphoric acid. Marion Horn

Cleavage of *d*-leucylglycine by serums, blood and organ extracts. I. Hans v. Euler, L. Ahlström, B. Högberg and Ann Marie Lilja. *Z. Krebsforsch.* 51, 248–72(1941).—Ability to cleave *d*-leucylglycine appears more often in the serum of cancer patients than in that of normal human subjects, but the difference is not sharp enough for use in diagnosis of cancer. Serum of rabbits with metastatic Brown-Pearce carcinoma showed regular ability to cleave *d*-leucylglycine. In the serum of a rabbit refractory to transplantation of Brown-Pearce carcinoma, ultraviolet irradiation elicited ability to cleave *d*-leucylglycine. Marion Horn

Complement fixation in rickettsial diseases. Ida A. Bengtson and Norman H. Topping. *Am. J. Pub. Health* 32, 48–56(1942); cf. *C. A.* 35, 7517[8].—The complement-fixation test for endemic typhus is of value in the detection of active or past infection. Titers of 1:128 and 1:256 may be reached on the 9th or 10th day of illness and 1:4,096 and 1:8,192 on the 14th or 15th day. The complement-fixation reaction is a better criterion of past infection with endemic typhus than is the Weil-Felix test as complement-fixing antibodies may be present in significant titers, up to 5 or more years after the illness. The complement-fixation test may probably be used to differentiate between endemic typhus and Rocky Mountain spotted fever. Spotted fever serums tested against a

narrow injury. The porphyrinuria is most intense in the presence of a bone narrow inhibition with the simultaneous appearance of a myelocytic shift in the bone narrow. This observation renders it not improbable that the porphyrinuria is to be connected with the primary disturbance in the bone narrow. The cardiovascular and central nervous injuries are interpreted as signs of porphyrin poisoning. Ruth Berggren

Miners' nystagmus. D. L. Davies. *Lancet* 1940, I, 873; *Zentr. Gewerbehyg. Unfallverhüt.* 27, 238(1940).—Miners' nystagmus is not considered to be a psychoneurosis. The illumination theory is also disputed. It is believed to be a form of chronic poisoning, caused either by bacteria or gases. Ruth Berggren

Physical diagnosis of radium poisoning. I. Franke. *Fundamenta Radiol.* 5, 113(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 124(1940).—The occurrence and course of Ra poisoning and the size of the toxic dose are considered. The necessary conditions for a method of diagnosis of Ra poisoning or for the supervision of those exposed to Ra have been studied. Detn. of the intensity and distribution of the Ra deposits by the γ-radiation emitted by the radioactive substances constitutes the most exact and certain method. A method is described which permits the detn. of Ra deposits in amts. of 0.2 μ g. Ra-element or more in a few min. An app. for carrying out the practical diagnosis of Ra deposition is described and the application is explained. Ruth Berggren

Röntgen study of the fine structure as a method of medical investigation. Gärtner. *Reichsarbeitsblatt* [N. F.], 20, III, 193(1940); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 228(1940); *cf. C. A.* 33, 7425⁸.—Quartz, fluorite, calcite, kaolin, clay, sillimanite, Carborundum, corundum and sericite, grindings of Main, Palatinate, Taunus and Rhön sandstone, dusts of MnO_2, Thomas slag, limestone and tobacco and grindings from the Solinger works were studied with a Mikro-Metallix-Röntgen fine-structure app. (Firma C. H. F. Müller). Tobacco dust from a tobacco factory was found to contain 20% insol. silicic acid. Dust from the lungs of miners, grinders and porcelain workers was also studied and compared in some cases with the industrial dust. A satisfactory diagnosis could almost always be obtained; it could, in part, be confirmed by chem. analyses. In some instances, only kaolin or sillimanite, without the participation of the free silicic acid, could be suspected as the cause of the siliconis. A quant. diagnosis is theoretically possible but meets with practical difficulties. Ruth Berggren

Pathological anatomy and pathogenesis of asbestosis. Giacomo Mottura and Emanuele Fugiano. *Rass. med. ind.* 11, 223-61(1940); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 229-30(1940).—Two fatal cases of asbestosis are described in detail: one occurred after 30 years of uninterrupted work in an asbestos plant, the other after 7 years of work followed by an interval of 30 years. This 2nd case would indicate that a relatively early change of work is of little value. Since asbestos particles were still present after many years and since no connection could be found between the no. of asbestos particles and the degree of fibrosis, the theory of the development of fibrosis by reduc. of the asbestos particles, followed by chem. reaction, is considered incorrect. The lymph capsules do not indicate any essentially sclerotic changes. The difference between these and silicosis changes is clearly shown. A relation between tuberculosis and asbestosis is not considered probable but a connection with the development of lung cancer is believed possible. Ruth Berggren

Recent questions in industrial hygiene. III. Dust. O. Ehrismann. *Dent. med. Wochschr.* 1939, II, 1281; *Zentr. Gewerbehyg. Unfallverhüt.* 27, 181(1940); *cf. C. A.* 34, 3287⁶.—Previous results of the study of siliconis, asbestosis, Thomas-slag pneumonia, and Mn and other dust injuries are given. Ruth Berggren

Use of the acidity quotient of the urine in the selection of stone cutters and those endangered by stone dust. A. Wiesinger. *Verhandlungsber. z. Arb. kunde* 7, 220(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 181(1940).—The development and progress of siliconis are believed to depend on the tissue acidosis; in acid lung tissue the dissolved silicic acid exerts a nonspecific acid irritation in addn. to its special irritant action, while in the alk. tissue the silicic acid, which gradually dissolves, is neutralized and excreted as a salt through the kidneys. A concept of tissue acidosis is outlined and a suitable method for detg. the acid-base ratio in the tissues is established. On the basis of this method, numerous examples are given which show that the acidity quotient is increased in stone cutters with severe siliconis, while low or neg. acidity quotients predominate in those with mild symptoms of siliconis, in spite of working with stone for years. The relation of the tissue acidosis to the pyknic habitus and mode of nutrition is illustrated with addnl. examples. The diet of those exposed to stone dust should be predominantly alk. and markedly severe phys. work should be avoided because of the increase in lactic acid. In severe pneumoconiosis with diminution of the alveolar surface and subsequent cardiac insufficiency, however, the combustion is lowered in consequence of O deficiency and a lasting tissue acidosis results. Ruth Berggren

Industrial application of a method for determining the thoron content of air. R. D. Evans, S. J. Nilson, C. Goodman and N. R. Bernz. *Ber. 8. intern. Kongr. Unfallmed. u. Berufskrankh.* 2, 1006(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 124(1940); *cf. C. A.* 34, 4334⁶, 4977⁵, 5102⁸.—A new instrument is described for the detn. of the Tn content of the air. Practical expts. in various factories with analytical evaluation in the lab. showed a Tn content of the air in individual locations in plants which was 100-1000 times higher than that which is ordinarily considered harmless. In such cases adequate ventilation should be provided. Ruth Berggren

Plastic molding. Leo Gussman and Murray H. Reich. *City Coll. Vector* (N. Y.) 5, 40-1, 52(1942).—Descriptive. The high first cost of molds and dies in both the compression and the injection processes is one of the largest items of expense in plastic molding. The use of plastic materials, as polystyrene, and synthetic rubbers, as the molds, opens new possibilities and new economies in the field of plastic molding. Leopold Scheflan

Synthetic-resin molding materials. E. Matuschek. *Fördertechnik* 32, 201, 385(1939); *Zentr. Gewerbehyg. Unfallverhüt.* 27, 235(1940).—A detailed article on the compn., manuf. and working up of molding materials and their many forms of use. Ruth Berggren

The thermal and electrical properties of bituminitic compounds containing quartz sand. Willis Jackson. *Phil. Mag.* 33, 81-9(1942).—An increase in the thermal cond. without appreciable detriment to the elec. properties is obtained by incorporating sand into compns. of the bituminitic type used as insulators. Data are reported for expts. made on 3 types of bituminitic comps. The addn. of 80% sand by wt. reduces the thermal resistance to less than one sixth of its normal value for any particular bituminitic. The effect of the sand grain size on the thermal resistivity is small. The decopping and pouring temps. begin to rise rapidly when the sand content reaches 70%. Quartz sand decreases the dielec. strength, but not by an objectionable amt. The power factor is increased, owing probably to moisture absorption. S. Tolansky

Properties of heat-insulating materials. E. A. Allcut and H. H. Hanly. *Eng. J.* 24, 514-24(1941).—A discussion of the character of heat-insulating materials, the difficulties in detg. their relative value experimentally, the effect of air spaces and surface resistance and the possibility of saving fuel by taking advantage of solar radiation and heat stored in the structure of the building itself. J. M. Noy

Production of dermatine on calenders. P. M. Bogatyrev and G. G. Petrikin. *Kauch.-Rezinovaia Prom. Lab. Glavkhkhimi* 1939, 105-12; *Khim. Referat. Zhur.* 1940, No. 4, 121.—Dermatine was prepd. on *differential* 3- and 4-roller calenders, with moleskin, duck, canvas and cambric as insulation. Best results were obtained by using 100 parts of collodion, 80 parts of dibutyl phthalate, 40 parts of castor oil, 100 parts of alc. and 125 parts of pigments. The mass, mixed in Werner-Pfleiderer

Nos. 2/3, 94–100(1942).—Eye injuries are discussed for mustard, lewisite, irritant smokes and tear gases. About 75% of eye injuries in the last war were mild cases, 15% were moderate and only 10% were severe. Ultimate blindness is very rare. Treatment consists of irrigation with weak $NaHCO_3$ or boric acid solns., normal saline or 0.5% dichloramine T in chlorinated paraffin. Eye patches or bandages should not be used. Details are given.
A. L. Kibler

The diagnosis and treatment of pulmonary gas casualties. Lina J. Boyd. *Bull. N. Y. Med. Coll., Flower and Fifth Ave. Hosp.* 5, Nos. 2/3, 64–70(1942).—The clinical picture described is that of phosgene since this is the most important of the pulmonary irritants. The symptomatology is considered from two standpoints: cases with acute and violent onset and cases with acute but insidious onset. Treatment should involve absolute rest until recovery is complete. Oxygen is the best single agent available. Venesection is indicated for certain conditions of the "blue" type but should never be used in the "gray" type or in case of circulatory failure or low blood pressure or thready pulse. Pneumonia is a frequent complication. Recovery seldom leaves chronic effects. The gas mask offers complete protection against phosgene and similar gases.
A. L. Kibler

Pathology of the vesicants and pulmonary irritants. Francis D. Speer. *Bull. N. Y. Med. Coll., Flower and Fifth Ave. Hosp.* 5, Nos. 2/3, 59–63(1942).—Changes caused by vesicant gases (mustard gas) are described under the headings of skin, eye and respiratory tract. Those due to suffocant gases (phosgene) are confined to the lungs with secondary effects on the heart and occasionally the brain. Details are given.
A. L. Kibler

Pathologic physiology of the respiration and circulation in war-gas poisoning. David Scherf. *Bull. N. Y. Med. Coll., Flower and Fifth Ave. Hosp.* 5, Nos. 2/3, 52–8 (1942).—The changes caused by the inhalation of toxic war gases are described under the headings of disturbances of the circulation. Owing to the great increase in the oxygen needs of the tissues caused by even mild exercise, complete rest is one of the essential requirements in the treatment of gassed cases.
A. L. Kibler

The symptoms, prevention and treatment of the effects of vesicants. Thomas H. McGavack. *Bull. N. Y. Med. Coll., Flower and Fifth Ave. Hosp.* 5, Nos. 2/3, 85–93(1942).—The war gases considered are mustard gas, lewisite and ethyldichlorarsine. Contrary to the statement in the text the last named was used by the Germans in the first World War. The ratio of the concn. of these gases necessary to cause casualty to that essential for the detection of the characteristic odor is emphasized but it should be stated that the concn. required to produce odor is affected by the purity of the gas, the tech. product being more easily detected than the pure material. The symptoms produced by each gas are described in detail. The discussion of the clinical pictures of the conditions caused by these vesicants include descriptions of the latent period, the period of acute reactions and the period of subacute or chronic reactions. Chronic pulmonary effects are the exception rather the rule in these cases. Of all the lesions caused by mustard gas those of the respiratory tract are the most serious but these can be protected against by the gas mask. Lewisite and ethyldichlorarsine produce systemic effects from arsenic poisoning. The treatment of all cases are discussed under the headings: preventive treatment, treatment after skin contact, and treatment after the lesion develops. Treatment after skin contact should be instituted within 5 to 15 min. to be effective. 9 references.
A. L. Kibler

A new point of view regarding the toxicity and the possibility of use of mustard gas. D. H. Wester. *N. V. L. Stud.-Org. Luchtbeschermaatregelen* 1, 228–9(1940); *Chem. Zentr.* 1940, II, 2055; *cf. C. A.* 34, 1709⁹.—Attention is called to some recent work of Deutrebande (*cf. C. A.* 34, 8100⁹). In addition to the blistering caused, mustard gas also has a general poisonous action, 0.07 cc. being a fatal dose for man. The gas can penetrate rubber gloves and cause poisoning without blistering. When breathed, the manner of dispersion in the air greatly influences the toxicity. E. g. the fatal dose of the gas vapor for rats is 120 mg./cu. m.; when the mustard gas is carried on a mist of a nonpoisonous aerosol the fatal dose is 20 mg./cu. m. and when carried on dense clouds of an aerosol it is 7–15 mg./cu. m. In this respect it resembles $COCl_2$ poisoning of the lungs.
M. G. Moore

Miscellaneous gas hazards. Lina J. Boyd. *Bull. N. Y. Med. Coll., Flower and Fifth Ave. Hosp.* 5, Nos. 2/3, 114–19(1942).—Incidence, symptoms, protection and treatment are discussed briefly for CO, nitrous fumes and screening smokes (P, chlorosulfonic acid, oleum, $TiCl_4$ and $SnCl_4$).
A. L. Kibler

Occupational diseases and the protection of those engaged in pest control. Erich Winkler. *Prakt. Desinfektor* 32, 123–5(1940); *Chem. Zentr.* 1941, I, 540.—CS_2, T gas, Trilox (trichloroacetonitrile), Flio (CCl_4 + an irritant), CCl_4, pyrethrin and rotenone are discussed.
M. G. Moore

Safety in laboratories and factories for inorganic chemicals. III. Phosphorus hydrides. Francis Barillet. *Industrie chimique* 1940, 123–6; *cf. C. A.* 35, 2000⁸.—Acute poisoning by phosphorus hydrides is possible only by absorption through the respiratory tract. The course of poisoning is similar to that caused by white P. The symptoms of chronic poisoning are anemia and nervous disorders. The proper gas-mask filling for phosphorus hydrides is $AgMnO_4$, $KMnO_4$ and activated C. Owing to its strongly endothermic nature, PH_3, like P_2H_4, may decompose explosively; P_2H_4, especially, is unstable in contact with various org. substances and under the influence of light. A 2% concn. by vol. of P_2H_4 makes it and other combustible gases spontaneously inflammable. HCl, H_2S, NH_3, etc., Et_2O and oil of turpentine in small quantities suppress this spontaneous ignition. Phosphorus trichloride, in tolerable concns., is but slightly irritating. Poisoning by PCl_3 causes dyspnea and, in severe cases, edema of the lungs. More dangerous are the effects on the skin because of burns; PCl_3 should be washed from the skin with Na_2CO_3. Efficient gas masks should contain soda lime and activated C. The statements made about PCl_3 apply in smaller degree for phosphorus pentachloride. Tetraphosphorus trisulfide, P_4S_3, is but slightly poisonous. In sensitive persons, contact with it may produce eczema. The temp. of ignition in air is 95–100°. Mixing it with most oxidizing agents produces explosive mixts. Transportation and storage precautions are the same as for white P.
R. Petermann, Morris B. Jacobs

Safety in laboratories and factories for inorganic chemicals. XIII. Arsenic and its compounds. Francis Barillet. *Industrie chimique* 1940, 201–4; *cf. C. A.* 35, 2000⁸; and preceding abstr.—B. gives a long survey of symptoms and course of poisoning. Acute poisoning is caused chiefly through the stomach; however, it also occurs through the respiratory tract and the skin. In chronic poisoning it is absorbed principally through the respiratory system but also through the skin and stomach. Arsenic-bearing dust is the most dangerous of all. Protection can be obtained by the use of fabric filters and goggles. For solns., rubber is necessary for protection.
R. Petermann, Morris B. Jacobs

Supermicroscopic investigations of asbestos dust and asbestos lungs. Joachim Kuhn. *Arch. Gewerbepath. Gewerbehyg.* 10, 473–85(1941).—Examn. by means of the Siemens supermicroscope of particles of serpentine and hornblende asbestos and of material isolated from asbestos lungs indicates that the serpentine asbestos is decomposed in the lung and is the cause of fibrosis. The hornblende asbestos shows no signs of decompn. by the organism.
W. Nowacki

Chlorinated hydrocarbons. Allan L. Coleman. *Connecticut Ind.* 20, No. 9, 11–12, 30–1(1942).—The properties, uses, health hazards, etc., are discussed for CH_2Cl_2, ClH_2C_2, CCl_4, CH_2ClCH_2Cl, $CHCl_2CHCl_2$, $CHCl:CCl_2$, CCl_3, CCl_3, chloroprene and chlorinated naphthalenes and biphenyls.
Leopold Scheflan

Notes on dust suppression and collection. J. Smellie.

Albert G. Reynolds and John T. Yolland (to R. Y. P. Mfg. Co.). U. S. 2,305,193, Dec. 15. Various structural, mech. and operative details.

Reclaiming carbon dioxide used in storage tanks for fruit juices. Bergedorfer Eisenwerk Akt.-Ges. Autra-Werke. Ger. 707,525, May 29, 1941 (Cl. 53k, 1.01).

Decomposition of dry vegetables. Chemisches Werk Dr. Kiepfer G. m. b. H. Ger. 707,762, May 20, 1941 (Cl. 53c, 6.01). The dry vegetables are comminuted and treated with solvents for chlorophyll and carotene. To the coln. is added a neutral fat and the chlorophyll and the carotene are distd. off.

Isolating vegetable proteins such as soybean protein. Percy L. Julian and Bernard T. Mailer (to The Glidden Co.). U. S. 2,304,096, Dec. 8. The material, such as soybean meal, is extd. with water, caustic alkali and lime are added to the sepd. ext., and the resulting alk. liquor is centrifuged and the protein is recovered from the clarified ext.

Preserving green feed. Wilhelm Klein. Ger. 708,834, June 5, 1941 (Cl. 53g, 5.01). Green matter is preserved with $Na_2S_2O_5$. For 100 kg. of the green matter, an aq. soln. of up to 20 g. of $Na_2S_2O_5$ and the required quantity of acid to decomp. this salt are used.

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

(PLASTICS, RESINOIDS, INSULATORS, ADHESIVES, ETC.)

HERMAN A. BRUSON

Medical institute in wartime. E. R. Weidlein. *Chem. Eng. News* 21, 467-76(1943); *cf. C. A.* 36, 2951⁹.—The annual report is curtailed because of wartime restrictions. A table shows the industrial fellowships in operation during the fiscal year March 1, 1942 to March 1, 1943 and some discussion is given of investigations on cotton, high-temp. electrical insulation materials, plate glass, special plastics for aircraft and (under the heading "War services of Industrial Hygiene Foundation") lost workdays in essential manufacturers, plant-hygiene surveys and toxicology, Mg-dust hazards, industrial exhaust ventilation and Al powder in the treatment of silicosis as well as (from the Institute's Department of Research in Pure Chemistry) synthetic antimalarials, modified cinchona alkaloids, congeneric synthetics and drug standardization. E. J. C.

Chemical industry advances in Brazil. Charles F. Bonilla. *Chem. & Met. Eng.* 50, No. 3, 96-9(1943). E. H.

Chemical warfare and the mission of the veterinary. R. G. Espinet. *Rev. med. vet.* 22, 437(1940); *Anales asoc. quim. argentina* 30, 219(1942).—Present knowledge of the action of chem. agents, their classification, and a description of the most important are given. Symptomatology, lesions and treatment of animals which have suffered from the effects of chem. agents, particularly horses and dogs, are given. E. M. Symmes

Protection of civilians from vesicant agents. T. F. Bradley, J. T. Cassaday, T. G. Moore and Wm. C. Moore. *Chem. Eng. News* 21, 373-5(1943).—A description is given of the mobile war gas casualty station developed by the Stamford, Conn. civilian defense group. The decontamination truck, carrying the hot-water shower, was constructed for approx. $600. A list of auxiliary equipment and an operation schedule are given. Use of mobile units of this type avoids vesicant contamination of regular transportation and first-aid facilities. Four references. Richard G. Rowe

Sorption of acetylene. E. V. Aleksevskii and O. M. Kuznetsova-Khasina. *J. Gen. Chem.* (U. S. S. R.) 12, 299-304(in English, 304-5)(1942).—The suitability of a variety of commercial carbons, charcoals, silica gel and $Fe(OH)_3$ gel and a variety of carbons treated with numerous inorg. salts, as packing for gas-masks or respirators for protection against acetylene; all of these materials were found to be totally unsuitable. The sorption isotherms were detd. for acetylene on ethyl heptadecyl ketone, cellulose, acetylcellulose, acetylstearoylcellulose, nitrocellulose and nitroacetylcellulose. Only cellulose and acetylstearoylcellulose were found to have appreciably large sorption of C_2H_2. G. M. Kosolapoff

The poisons in chemical industry. Victor Andriska. *Kem. Listy* 2, No. 10, 2-3, No. 11, 1-4(1941); *Chem. zentr.* 1942, I, 1403.—A review on the various poisonous [illegible] manner of entering the organism, [illegible] treatment and prophylaxis.

1941, 465(1941); *Chem. Zentr.* 1942, I, 1907.—SO_2 injuries (frequently occurring in founding Mg alloys) although generally of temporary nature, may lead to indispositions lasting a week or longer. R. P. E. Hopf

The occupational cancer of asbestos workers. A. J. Linbach and H. W. Wedler. *Arch. path. Anat. (Virchow's)* 307, 387-400(1941); *Chem. Zentr.* 1942, I, 1613; *cf. C. A.* 33, 9458¹.—Description of a severe asbestosis of the lungs in a 60-year-old man with development of a corrodying squamous-celled epithelioma in the right inferior lobe. Asbestos injury was considered to be the cause of the cancer. The disease is, therefore, in agreement with Nordmann (*C. A.* 36, 2000⁹), to be considered as occupational cancer. Mech. tissue injury and chem. effects (hexachloride and serpentine asbestos) are involved as injurious factors of the asbestos. Ruth Berggren

Advances in plastics during 1942. C. M. Kline. *India Rubber World* 107, 673-6; *Mech. Eng.* 65, 245-7, 293 (1943); *cf. C. A.* 37, 1205¹.—A review, with 110 references. C. C. Davis

The influence of temperature on the strength of plastics. II. Impact strength at high and low temperatures. R. Nitsche and E. Salewski. *Kunststoffe* 31, 281-8 (1941); *Chem. Zentr.* 1942, I, 635; *cf. C. A.* 34, 8104¹.—Strength tests were performed on 26 plastics in the temp. range −70 to +200°. Test specimens 10 × 15 × 120 mm. were used. The specimen was previously brought to the desired temp. then placed in position in the pendulum-type testing app. and sprayed with liquid of the same temp. The liquid stream was interrupted only for the actual test. The influence of temp. on strength is most marked in the cellulose derivs. In unlaminated moldings the strength-temp. curve depends largely on the nature of the filler. Laminated moldings show a steady increase in strength up to about +80°, above which it starts to diminish. Among the thermoplastics polyvinyl chloride and "Copolymer MP" show a marked temp. effect above 0°. It is proposed to use 20 = 1° as a test temp. for cellulose acetate Type A, benzyl cellulose, vulcanized fiber and Cl-contg. vinyl polymerizates; 20 = 2° for other plastics. There is no obvious relationship between the impact strength-temp. curve and the impression hardness-temp. curve. Anthony M. Schwartz

Investigation of the mechanical behavior of synthetic resins at low temperatures and its dependence upon preparation and pretreatment. W. Röhrs and K. H. Hauck. *Kunststoff-Tech. u. Kunststoff-Anwend.* 11, 213-28(1941); *Chem. Zentr.* 1942, I, 842-4.—Investigation of the modulus of elasticity (I), and the elastic limit (II) of hardenable and nonhardenable synthetic resins in relation to temp. in the realm of low temps. (+20 to −70°). From compression measurements with a definite compression velocity, I and II were detd. in relation to temp. Expansion measurements and polystyrene viscosity measurements also served to complete the investigation. For phenol-formaldehyde cast resins and molding compds. as well as urea-formaldehyde molding material, the influence

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V. H. CHILTON

Chemical industry stable. H. McLeod (Chief Mining, Met. and Chem. Branch, Dominion Bureau of Statistics). *Can. Chem. Process Inds.* 30, No. 5, 42–54(1946).—Most industries maintained high production levels in 1945, while explosives and ammunition showed drastic decline. W. H. Boynton 2

Lead intoxication by inhalation. Lawrence H. Cotter (Columbia Univ.). *J. Ind. Hyg. Toxicol.* 28, 44–6 (1946).—A report of 10 cases. G. M. Petty

Evaluation of urinary lead determinations. II. The approximate upper limit of urinary lead excretion for persons at work. Leo Levine and John P. Faby (Massachusetts Dept. Labor and Inds., Boston). *J. Ind. Hyg. Toxicol.* 28, 98–9(1946); cf. *C.A.* 40, 1102⁵.—A table and curve of the frequency distribution of urinary Pb concns. of 1156 samples taken from exposed workers during working hours are presented. The max. incidence occurred at 0.10 mg./l. 276 samples contained 0.20 mg./l. or more. Apparently *0.60–0.80 mg./l. is* the upper limit for persons on the job. G. M. Petty 3

Benzene. Anon. *Mfg. Chemists' Assoc. U.S., Chem. Safety Data Sheet* SD-2, 16 pp.(1946).—Important phys. and chem. properties of C_6H_6, its hazardous characteristics, both physiological and flammable, and essential information for its safe handling and use. P. J. Wilson, Jr. 4

Summary of twenty-two trinitrotoluene fatalities in World War II. W. J. McConnell and Robert H. Flinn. *J. Ind. Hyg. Toxicol.* 28, 75–86(1946).—Case reports. 8 references. G. M. Petty 5

Eight cases of methyl chloride poisoning with three deaths. Wm. D. McNally (Toxicologist to the Coroner of Cook County, Chicago). *J. Ind. Hyg. Toxicol.* 28, 94–7(1946).—Case reports. G. M. Petty

Sanitation of a laboratory with high mercury content. Preparation and use of bromine-carbon. J. Gillis (Univ. Gent). *Meded. Vlaamsche Chem. Ver.* 7, 223–8 (1945).—Chronic Hg poisoning of laboratory personnel is not uncommon; 60-yr old lab. rooms at Gent had generally more than 20 γ Hg per cu.m. The situation was improved by thorough cleaning, planing the wood floor, repainting and scattering around of Norit C contg. 10% by wt. of Br. The Hg content of the air decreased to 2.5 γ per cu. m. or less. Mercury determinations in air of laboratories and in urine of personnel working in these laboratories. *Ibid.* 300–9.—Detailed data are given on Hg content of the air before and after cleaning of old lab. rooms; max. values of 92 γ per cu.m. were found, which decreased to 2–4 γ per cu.m. The personnel working in localities with 20 γ or more in air had up to 8 γ Hg per l. urine, persons with amalgam fillings in their teeth had as high as 35 γ per l. Cases of Hg poisoning are described, including that of the author and of several dentists. There is a considerable difference in the reactions of individuals. B. J. C. van der Hoeven 6 7

A health survey of pipe-covering operations in constructing naval vessels. Walter E. Fleischer, Frederick J. Viles, Jr., Robert L. Gade, and Philip Drinker. *J. Ind. Hyg. Toxicol.* 28, 9–16(1946).—The character of the asbestos-pipe-covering industry on naval vessels is such that conclusions drawn from other asbestos industries cannot be applied. The operations of bandsaw cutting, grinding, cement mixing and installation on ships should be equipped with exhaust ventilation to keep the dust concn. low. There were 3 cases of asbestosis among 1074 workers in 4 shipyards. Since each of the 3 cases had worked at asbestos pipe covering in shipyards for more than 20 years, it is evident that this occupation is not dangerous. 3 references. G. M. Petty 8

Mineral resources of western Africa. G. Arnaud. *Ann. mines & carburants, Mém.* 134, 639–738(1945). E. H. and E. N. Cameron (U.S. Geological Survey, Washington, D.C.). *Am. Inst. Mining Met. Engrs., Mining Technol.* 10, No. 3, *Tech. Pub.* No. 2024, 6 pp.(1946).—An analysis of wartime operations, and future outlook. New England supplied about 22%, or 5600 tons, of the domestic output of mica from approx. 125 deposits in 1943 and 1944. A crew of 5 or 6 men worked a deposit by drilling with jackhammers, hand shoveling muck into buckets with a ½-ton capacity, and hoisting by derrick to a dump near the cut. Mica was sorted from muck, bagged, and loaded into trucks for shipment, all by hand. Under the economic conditions of 1943 and 1944 minable reserves in known deposits would sustain operations for 3 to 4 yrs. at the 1943–1944 rate of production. C. W. Schuck 9

Practical methods used for dust disposal. C. C. Hermann (Grosse Pointe Park, Mich.). *Chem. & Met. Eng.* 53, No. 6, 136–8(1946); cf. *C.A.* 40, 3655⁸.—Three methods are discussed, e.g., salvage the collected dust, destroy the dust by burning, and wet down and deposit the collected dust in suitable areas. J. H. Wiegand

Exposures to oxides of nitrogen accompanying shrinking operations. Frank E. Adley (State of Washington Dept. of Health, Seattle). *J. Ind. Hyg. Toxicol.* 28, 17–20 (1946).—The use of large oxyacetylene shrinking torches, particularly in small, unventilated compartments can produce dangerous concns. of oxides of N in a few min. Contact of the flame with cold water or cool metal had no noticeable effect on the production of oxides of N. There was a close correlation between the rate of production of this gas and the rate of burning of C_2H_2 by the torches. When the shrinking operation was carried out in large, ventilated spaces, the concn. of oxides of N was reduced, but was sometimes still excessive. Even in small, unventilated compartments there was no health hazard from CO. G. M. Petty

The assay of rennet. H. Delfour. *Bull. trav. soc. pharm. Bordeaux* 81, 20–1; *Ann. pharm. franç.* 1, 121–2 (1943).—The titer of rennet is the quantity of sound, raw milk, of normal acidity, which 1 l. of rennet can curdle in 40 min. at 35°. A titer of 1:10,000, or normal titer, is that of a rennet of which 1 l. can curdle 10,000 l. of milk in 40 min., or 1000 l. in 4 min. In the detn. of the titer, 5 cc., 1 cc. or 0.1 cc. (or preferably 1 cc. of a 1:10 dil.) of rennet is used according to its expected titer. Place 100 cc. of milk in a porcelain dish, heat on the water bath to a const. temp. of 35° (to the coagulation time, add or subtract 7 sec. for each ° below or above 35°), slowly add the rennet while stirring with a thermometer, draw a line with the bulb of the thermometer at the surface of the milk, and note with a stopwatch the time required for the production of a persistent mark; this indicates curdling of the milk. A table is given from which the titer can be obtained. A. Papineau-Couture 10

Insulation of metallurgical furnaces and steam boilers. A. S. Galdin. *Za Ekonomiyu Topliva* 3, No. 1, 15–17 (1946).—Five combinations of sawdust, asbestos fiber, and diatomite were tested as external insulation for metallurgical furnaces and boilers. Sawdust 30–70, asbestos 0–60, and diatomite 0–50% were used in these compns. The ingredients were dry-mixed by hand and then H_2O was added to form a consistency of thick cream. On crowns the insulation was applied directly, on vertical walls wire netting was used in some cases. The preferred method, not always followed, is to apply first a gas-impermeable layer, then a heat-insulating layer, and on top a sealing layer. The gas-impermeable layer was made of ground Dinas 60, powd. asbestos 30, and refractory clay 10%. The dry mix was combined with 30% soln. of water glass. This layer was ordinarily 3–6 mm. thick. The heat-insulating layer was up to 100 mm. thick. The sealing layer was an aq. suspension of asbestos, its thickness 5–10 mm. The heat-insulating layer dries and, where the temp. is high, the sawdust burns out. The 11

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

L. H. CHILTON

Chemical synthesis and world trade. R. P. Linstead. *Discovery* 8, 366–9(1947).—Antiknock petrol is made by introducing branched-chain hydrocarbons rather than metallic compds. Butadiene (synthetic rubber) is synthesized by condensing C_2H_2 with formaldehyde in presence of copper acetylide. This yields 2-butyne-1,4-diol, which is hydrogenated to 1,4-butanediol, which is in turn dehydrated to butadiene. There still remains a large field, notably foodstuffs, in which large-scale synthesis has not yet been found practicable. N. Corcoran

Partners in research. Anon. *Chem. Eng. News* 26, 904–6(1948).—Excerpts from the 11th annual report of the Armour Research Foundation. Various research projects are outlined. E. J. C.

The industrial hygiene services of the Illinois State Department of Public Health. Kenneth M. Morse (Illinois Dept. of Pub. Health, Chicago). *What's New in Ind. Hyg.* 3, No. 1, 6–7(1946).—Descriptive. Leopold Scheflan

Industrial ventilation. Kenneth M. Morse (Illinois Dept. of Pub. Health, Chicago). *What's New in Ind. Hyg.* 3, No. 2, 6–11, No. 4, 7–15(1948).—Descriptive. Leopold Scheflan

Electrostatic precipitation of industrial dust, fumes, and vapors for hygienic purposes. D. Parris. *Russ. med. ind.* 16, 16(1947); *Brit. J. Ind. Med.* 5, 47(1948).—Electrostatic pptn. is of great value for sepg. arsenical vapors in H_2SO_4 plants and for removing finely divided valuable or dangerous products from coke ovens. Its efficiency is 90–100%. Marion Horn Peskin

Determination of chlorinated hydrocarbons in industrial atmospheres. Alfred N. Setterlind (Illinois Dept. of Pub. Health, Chicago). *What's New in Ind. Hyg.* 4, No. 1, 9–17(1947).—The construction is described in detail of a light-wt. app. suitable for field work which is built around the principle that when vaporized chlorinated hydrocarbons are passed together with air over incandescently heated Pt and then through a soln. of a reducing agent, HCl is formed in amt. equiv. to the Cl present in the hydrocarbon vapors. If the absorption medium is a liquid of definite vol. and alky., the amt. of HCl obtained during sampling may be detd. by direct titration to a neutral point with HCl of convenient strength. The absorbing reagent actually used was an accurately measured vol. of a soln. of Na metaarsenite. Detailed information is given on the microfurnace, winding the quartz rod, the absorption assembly, the Akrite nozzle, calibration of the capacity of the pump, sampling technique, the chem. detn., and the titration. Leopold Scheflan

Asbestosis. P. Luton and J. Champfix. *Arch. maladies profess. méd. travail et sécurité sociale* 7, 365(1946); *Brit. J. Ind. Med.* 5, 44(1948).—In a factory processing waste asbestos, the atm. dust concn. was 6–74 mg./cu.m., and the dust contained 2–14.6% free silica; most of the particles were large. When raw Canadian asbestos was substituted for the waste asbestos, the atm. dust concn. fell to 6–11 mg./cu.m., there was no free silica, and 90% of the particles were not larger than 1μ. Asbestosis bodies appeared in the sputum within 3 months after exposure and persisted for as long as 15 years after exposure had ceased. Although these bodies were found in all exposed to the dust, their presence in numerous amts. and massed arrangement in the sputum provided partial diagnostic evidence of pulmonary asbestosis. M. H. Peskin

Copper fever. L. Friberg and E. Thrysin. *Nord. Hyg. Tid.* 28, 5(1947); *Brit. J. Ind. Med.* 5, 31(1948).—Fever and various other signs of poisoning occurred for a few days in workmen after they cleaned a dusty oven contg. 1–15μ particles of Cu and its oxides, in a factory producing BuOH from crotonaldehyde. The cleaning process was preceded by the blowing of steam through the oven to rid it of certain gases; the cleaning itself took usually 2–8 hrs., occasionally up to 24 hrs. No permanent sequels to the poisoning were noted in 60 workers exmd. Masks were found satisfactory for preventing further accidents. Marion Horn Peskin

Monsanto products in Canada. L. K. La Flamme, E. O. Gould, and A. Monsaroff. *Can. Chem. Process Inds.* 32, 253–4, 257(1948).—A progress report. W. H. B.

Sulfuric acid index of production follows industrial activity. C. C. Concannon and P. M. Hoffheins (Office of Domestic Commerce, Washington, D.C.). *Chem. Eng. News* 26, 1672–3(1948). E. J. C.

Milk as a chemical raw material. Herbert Kuntscher. *Milchwissenschaft. Forschungsinst. Ind. Osterr.* 1, 99–102(1947).—A review with 25 references. E. H.

Studies on aerosols. I. Reduction of dust deposition in lungs of rabbits by aqueous aerosols. L. Dautrebande, B. Highman, and W. C. Alford (Natl. Inst. of Health, Bethesda, Md.). *J. Ind. Hyg. Toxicol.* 30, 103–7(1948).—Inhaled fine dust particles may cause injurious effects which are lessened by the use of aq. Aerosol O. T. This is shown by the less severe pathol. pulmonary changes and particularly by the striking absence of severe respiratory embarrassment in rabbits exposed to dust when this aerosol is used. The amt. of dust deposited, particularly in the alveolar ducts and alveoli, is greatly reduced by this aerosol. These data were obtained with a willemite dust suspension of av. diam. 0.90μ. The particles are readily identified by their fluorescence under ultraviolet radiation. A considerable part of the effect of the aerosol is due to the increase in the diam. of the individual dust particles when they are coated with water and to the aggregation of such wetted particles. II. Coating and agglutinating of dust particles by aqueous aerosols. L. Dautrebande, W. C. Alford, and B. Highman. *Ibid.* 108–13.—Clouds of willemite and quartz particles were produced, with av. particle diams. <1μ. When the dust clouds were mixed with aerosols generated from distd. water and from eosin solns., the mean particle diam. increased 50–100%, owing to a liquid coating. There were aggregates of much larger diam. These results suggest that aerosols may be found useful for supplementing (but not to replace) current methods used for the control of dust hazards in occupations where large amts. of fine dust are dispersed, such as drilling, smelting, and cement making. G. M. Petty

Filtration of aerosols by granular charcoal. Sidney H. Katz and Duncan Macrae (Army Chem. Center, Edgewood, Md.). *J. Phys. & Colloid Chem.* 52, 695–7(1948).—The absorption of vapors by gas-mask charcoal is known (Klotz, *C.A.* 41, 234c) to be characterized by a const. that is proportional to the 0.41 power of the product of the granule diam., mass rate of flow, and fluidity of the vapor. Data for the absorption of a dioctyl phthalate aerosol with particle diam. of 0.3μ give a similar const. that is proportional to the 0.41 power of the same product. The agreement between exponents indicates that granular charcoal filters aerosol particles and vapor mols. by much the same mechanism, even though the diffusion consts. involved differ by a factor of 100,000. H. K. L.

Utilization of short-chain paraffins and olefins in chem. industry (Nelson) 22. *Patents:* Prepn. of fluoroalkanes [ingredients of refrigerants] (Hoehn) 10. Halogenation of fluorinated compds. [as solvents] (Barrick) 24.

Begeman, M. L.: Manufacturing Processes. 2nd ed. New York: John Wiley & Sons. 1947. 626 pp. Reviewed in *Chimie & industrie* 58, 144(1947).

Brandenberger, E.: Grundlagen der Werkstoffchemie. Zürich: Rascher-Verlag. 1947. Fr. 21.

Aerosols. Irving Langmuir and Vincent J. Schaefer (to General Electric Co.). U.S. 2,437,963, Mar. 16, 1948. An aerosol is produced by vaporizing a material which does not tend to evap. at ordinary atm. temps. in

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the variations of carotene and those of the protein content. E. L. Green

Ensilage tests with Vitasan. N. D. Dijkstra (Rijkslandbouw Proefstation, Hoorn, Nederland). *Maandbl. Landbouwmarktkingsdienst* 5, 302–6(1948).—This cont. a prepn. did not improve the quality of grass ensilage. O. W. Willcox

Importance of P for teeth (von Fellenberg) 11G. *Patent:* Sheet wrapping materials [for oily or fatty foods] (Brit. Cellophane Ltd.) 31.

Crosbie-Wash, T.: Food Industries Manual. 15th ed. London: Leonard Hill Book Co. 1947. 1168 pp. 42s. Reviewed in *Chemistry & Industry* 1948, 429.

Soup flavor from shellfish. F. de Gruyter & Zn. N. V. and N. V. H. Hartog's Fabrieken. Dutch 61,294. July 15, 1948. Inferior starting material as small shrimps or crabs can be used by removing its $CaCO_3$ by HCl, washing, and hydrolyzing. E.g. 100 kg. steamed shrimps is stirred in a wooden vessel with 10 l. HCl at 22%, thrice washed by 50 l. H_2O to remove $CaCl_2$ and turned into soup flavor by hydrolysis. A. J. C. de Waal

Aromatic drink from vegetable material. Karel Beyer. Dutch 61,388, July 15, 1948. Material contg. polyhexoses and polypentoses is extd. under pressure by H_2O contg. an alk. compd. giving a pH 7.5–8.0. E.g., 80 kg. rye bran and 20 kg. wheat grit are mixed with a soln. of 2.7 kg. $KHCO_3$ in 50 l. H_2O. The pH is 7.8. This mixt. is heated 40 min. at 190° in an autoclave, and after cooling, the reaction product is dried and milled. One kg. of this powder is extd. by 4 l. boiling H_2O and filtered. The drink may be concd. or dried. A. J. C. de Waal

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

T. H. CHILTON

Stimulation of industry by research. S. R. Madigan (B.C. Research Council, Vancouver, Can.). *Ind. Can.* 49, No. 2, 62–5(1948).—An address relating manufg. income to industrial research. B. C. projects include plastic impregnation of soft woods, utilization of wood wastes, and studies of foundry and mineral-dressing problems. Gordon R. Finlay

Setting property of agar-agar. Diptish Chakrabarty (Bengal Immunity Lab.). *Quart. J. Pharm. Pharmacol.* 21, 159–61(1948); cf. *C.A.* 41, 1355h.—Deterioration of the setting property of agar on storage was observed. A probable cause of such deterioration is discussed. A technique for standardization of setting power of agar was tried and appears to be of practical value. Irrespective of total reducing-sugar content, the setting property varies with the pectin content. S. W. Goldstein

The synthetic materials industry in the United States of America—a survey of the developments of the last years. E. Escales, K. Hultzsch, and E. Rösner. *Kunststoffe* 37, 117–22(1947).—Types, production, raw materials, and manufg. companies are described. M. Hartenheim

Handling industrial solvents with safety. A. Ernest MacGee, Lester J. Weiser, and Carl H. Senter (Skelly Oil Co., Kansas City, Mo.). *J. Am. Oil Chemists' Soc.* 25, 279–95(1948).—This subject is discussed comprehensively with tabulated data regarding fire hazards and health hazards with possible general physiol. effects of various solvents and the concns. necessary to produce unfavorable effects. 36 references. E. Schwerdtel

Symposium on industrial diseases. Some considerations of the Röntgen diagnosis of silicosis and the conditions that may simulate it. Eugene P. Pendergrass and Agrippa G. Robert. *Radiology* 50, 725–45(1948). Significance of occupational history in diagnosis of silicosis. Theodore F. Hatch. *Ibid.* 746–50. Anthracosilicosis. William J. Corcoran. *Ibid.* 751–4. Pathogenesis of industrial pulmonary disease. Willard Machle. *Ibid.* 755–8. Further observations of lung changes associated with the manufacture of alumina abrasives. Cecil G. Shaver. *Ibid.* 760–9. Delayed chemical pneumonitis or diffuse granulomatosis of the lung due to beryllium. Stanley A. Wilson. *Ibid.* 770–85. G. L. Clark

Study of asbestosis. P. Luton, J. Champcix, and Favre. *Arch. maladies professt. méd. travail et sécurité sociale* 8, 131–2(1947); *Chimie & industrie* 59, 150(1948); cf. *C.A.* 42, 3875g.—A general discussion, more particularly of the symptoms and diagnosis. A. P.-C.

Professional phenolodermatitis. Carlo Cereda (Univ. Milan). *Med. lavoro* 39, 80–2(1948).—Dermatitis developed on the arms of men sawing beech wood impregnated with mineral oil as a consequence of the exposure to the saw dust. Analysis showed the presence of phenolic compds. in the wood. Comparative skin reactions produced with 0.2% PhOH proved that these compds. were the offending agents. It is supposed that the phenols are liberated in the wood during the process of impregnation with hot mineral oil. A. E. Meyer

Patents: (Trimethylsilyl)methylpentamethyldisiloxane [useful in dielec. liquids] (Speier) 10. Unsatd. chloro nitriles [chem. intermediates and solvents] (Cass) 10.

Champetier, G.: La grande industrie chimique minérale. Paris: Presses Univ. de France. 1947. 128 pp. Fr. 75. Reviewed in *Ann. pharm. franç.* 6, 128(1948).

Chaplet, A.: Dictionnaire des produits chimiques commerciaux et des drogues industrielles. 3rd ed. Paris: H. Dunod. 1948. 448 pp. Fr. 1270. Reviewed in *Industrie chimique* 35, 139(1948).

Fokin, L. F., and Pavlov, K. F.: Metodi di calcolo dei procedimenti e delle apparecchiature per l'industria chimica. Milan: G. C. Göttsch. 1948. 511 pp. L. 2500.

Smith, Edward S.: Statistical Quality Control. New York: McGraw-Hill Book Co. 1948. 161 pp. $3. Reviewed in *Chem. Eng.* 55, No. 8, 294(1948).

Woodbury, D. O.: Battle Fronts of Industry. New York: John Wiley & Sons. 1948. 342 pp. $3.50.

International Industry Yearbook. 1948 ed. Edited by Lloyd J. Hughlett. New York: Kristen-Browne Pub. Co. 1948. 414 pp. $10. Reviewed in *J. Am. Ceram. Soc.* 31, 191(1948).

List of Chemical Industrial Plants in Japan. Tokyo: Ministry of Commerce and Industry. 1948. 532 pp.

Decomposition products of proteins. N. A. Schöfeld (to Aktiebolaget Berol-Produkter. Swed. 120,003, Oct. 28, 1947. Proteins are treated in the presence of water with alk.-reacting org. compds. and in the absence of other protein-splitting compds., until the product is sol. in acid. Examples are given in which (1) casein is boiled with water and triethanolamine; (2) casein is boiled with water and ethylenediamine; and (3) gelatin is heated under pressure with water and pyridine. The products are not ppd. on adding HCOOH or AcOH. R. D. S.

Dry water-soluble salts of alginic acid. A/S Protan. Norw. 73,484, May 10, 1948. Water-sol. salts of alginic acid obtained by treating seaweed with alkaline agents are obtained in a dry form by sepg. the alginic acid by means of acid, mixing with an org. solvent, such as alc. or acetone, which dissolves water but not the alginates, neutralizing with an alkali in the presence of the min. amt. of water and drying the product. R. D. Satchell

Removing moisture from organic solvents. Kyn[illegible]nakeyhtiö. Norw. 73,652, June 28, 1948. Org. solvents, particularly solvents which are obtained by chlorination processes and which contain Cl and(or) SO_2, are dried by treatment with dry Cl and SO_2 which form HCl and H_2SO_4 with the

E. B. Hughes, *et al. Ibid.* 856–801. Fine chemicals and medicinal substances. N. R. Campbell. *Ibid.* 802–14. Essential oils, isolates, and derivatives. G. R. A. Short. *Ibid.* 815–21. Photographic materials and processes. D. J. T. Howe (Elliott & Sons Ltd., Herts, Eng.). *Ibid.* 822–43. Sanitation and water purification. John Hurley. *Ibid.* 844–901.—Reviews with many references. Cf. *C.A.* 42, 1613ᵉ. G. G.

Chemistry industry and the National Security Resources Board. W. T. Hack. *Chem. Eng. News* 26, 2284–5(1948). E. J. C.

Heavy chemical industries. D. Venkateswarlu. *Indian Textile J.* 58, 919–20(1948).—A review and comparison is made of some aspects of the chem. industry in India and abroad. W. H. Boynton

Chemicals—industrial giant. Caldwell R. Walker. *Ufrs.' Record* 117, No. 8, 35, 57–8(1948).—A brief survey of the industry. Leopold Schellan

Chemical industries of Japan. Campbell Osborn (213 Woodward Bldg., Washington, D.C.). *Chem. Eng. News* 26, 2018–21(1948). E. J. C.

A plan of industrial training for chemists and engineers. Charles H. Kline, Jr. (General Elec. Co., Pittsfield, Mass.). *Chem. Eng. News* 26, 2602–4(1948). E. J. C.

Work at Israel's Sieff Institute. Milton Orchin (Bur. of Mines, Pittsburgh, Pa.). *Chem. Eng. News* 26, 2956–7 (1948).—The work and personnel of the Daniel Sieff Institute in Rehoveth, Israel, are described. In addn. to basic research much effort is devoted to problems relating to the intensive industrialization and scientific agriculture that are needed to support a large number of people in a small land area. Milton Orchin

Rock wool investigations. G. F. Murphy and E. DeWolfe (Nova Scotia Tech. Coll., Halifax). *Nova Scotia Dept. Mines, Ann. Rept.* 1946, 151–5(1947).—The important consideration in the choice of raw materials for rock wools is that the material be self-fluxing. If the acidic and basic portions are nearly equal by wt., and the loss on ignition (CO_2) is between 20 and 30% the material will be suitable. Chem. analyses of various limestones are given, and mixts. suggested for obtaining better-quality rock wool. Marie L. Lindberg

Report on industrial minerals. M. C. Coudge (Dept. Mines, Halifax). *Nova Scotia Dept. Mines, Ann. Rept.* 1946, 67–80(1947).—Production and mine operations for barite, ceramics, dolomite, fluorspar, granite, gypsum, limestone, salt, and slate are described. M. L. L.

Report on industrial minerals. M. C. Coudge (Dept. Mines, Halifax). *Nova Scotia Dept. Mines, Ann. Rept.* 1947, 56–60(1948).—Production and mine operations for barite, ceramics, granite, gypsum, limestone, oil, salt, and silica are briefly described. Marie L. Lindberg

Sensitivity of calcium silicide smoke mixtures to static electrical discharge. Archibald Gillies (Natl. Research Labs., Ottawa, Can.). *Can. J. Research* 26F, 297–301 (1948).—During the recent war a number of fires occurred in plants prepg. a smoke mixt. contg. $CaSi$ 10-C_2Cl_6 45-ZnO 45%. When blended thoroughly the mixt. burns relatively slowly. Such behavior led to the misconception in the plants that the materials were quite safe to handle in all possible combinations. A static electricity generator was used to test 0.5 g. samples of various combinations of the ingredients to det. the lowest voltage required to cause ignition. It was concluded that there is a wide range of mixts. with silicide content varying from 20-90% that can be readily ignited (50 v. or less). To avoid such concns., the final mix was approached from a 50-50 ZnO-C_2Cl_6 mixt. These two components were well blended and the $CaSi_2$ was slowly added. No fires were experienced under the above mentioned procedure. James C. Hubanks

Cyclone apparatus for dust-separation industries. W. Muhlrad. *Génie civil* 124, 152–5(1947).—Practical formulas are developed for detg. the effect of different physical and structural factors on the efficiency of the collector unit, also, for detg. the best yield obtainable under a given condition. The phys. laws involved in sepg. dust from a gas are discussed in detail. In practice, it was found that increasing the temp. of the gas from 0° to 400° increased the wt. of dust not collected by 50%. A reduction in density of the dust particle from 1.8 to 0.8 increased the wt. of dust particles not collected by 60%, due to the film of gas. Each app. has its optimum speed. Dynamic dust collectors are not satisfactory for tiny particles (microns in size), for toxic dusts, or for the recovery of valuable dusts, where 100% efficiency is desired. Recent progress suggests an ultimate yield of 92–95%. Ann Nicholson Hird

An improved method of reclaiming industrial diamonds from bit drills. A. R. Hazelgrove (Can. Industries Ltd., McMasterville, Que.). *Can. Metals Met. Inds.* 11, No. 9, 20(1948).—Diamond reclamation from drill bits may be effected from the 3 types of powd. alloy rings. The types are: (I) iron, W, brass, C alloys, (II) iron, WC, brass alloys, and (III) Cu-Co-Mo alloys. The treatments are: for (I): (a) The bits are dissolved in a mixt. of 40–60 pts. 70% HNO_3, 40–20 pts. 60% HF, and 20 pts. water. The salts, after decanting the excess acid and washing the salts with water, are dissolved by one of 2 methods: a 1:1 mixt. of NH_4OH and water is added to the salt, stirred and filtered, and washed with warm HCl (1:1) or a mixt. of 1 pt. H_3PO_4 (85%) and 1 pt. water is added to the crystals and the mixt. stirred and warmed if necessary; (b) Alternately the bits are dissolved in a mixt. of 1 pt. HNO_3 (70%), 1 pt. HF (48% or 60%), and 1 pt. H_3PO_4 (85%). This mixt. will dissolve all but minor amts. of C. This alloy is not sol. in b, but the salts resulting from soln. in the regular HNO_3-HF acid mixt. are sol. in the same reagents and by the procedure as Type I alloy except for warming the mixt. with 1:1 H_3PO_4 to effect soln. (III) This alloy is completely sol. in: (a) 40–60 pts. HNO_3, 40–20 pts. HF, and 20 pts. water, or (b) the same mixt. as in I. W. H. Boynton

Radiation hazards in industry. Charles R. Williams (Harvard School of Public Health, Boston, Mass.). *J. Ind. Hyg. Toxicol.* 30, 294–9(1948).—The industrial use of x-rays, and of naturally and artificially radioactive elements is discussed. G. M. Petty

Working conditions and health protection measures in the mining of ozocerite. P. L. Bagenskii (Kiev. Inst. Profess. Hyg.). *Gigiena i Sanit.* 13, No. 5, 24–8(1948).—Analyses of air samples taken from various parts of the mine showed the presence (in mg./cu. m.) of hydrocarbons 0.1–11.56, CH_4 0.3–2.73, CO_2 1.01–2.73, H_2S traces–0.003, SO_2 traces–0.0085. The limits of the compn. of the hydrocarbons (other than CH_4) were: total satd. 2.3–5.06, total unsatd. 0.62–0.62, heavy satd. 0.5–1.5, heavy unsatd. traces, light satd. 2.32–5.19, light unsatd. 0.6–1.56. The relative compn. of the hydrocarbons, in %, was CH_4 1–4, light satd. 46–72, light unsatd. 10–25, heavy satd. 10–24, heavy unsatd. traces, aromatic traces. During the 1st 2 hrs. after mining, 5 g. ozocerite evolved, in mg./l. air, light hydrocarbons 24.27, heavy 30, CH_4 0.48; the amts. evolved during the 1st 2 hrs. by the ozocerite-contg. ore, were 1.22, 1.88, and 0.31, resp. Ventilation and other protective measures are discussed. N. Thon

Contamination of air with lead from molten typographic metal. V. G. Matsak (Central Hygiene Lab., Moscow). *Gigiena i Sanit.* 13, No. 5, 46–8(1948).—As a rough approximation, 1 sq. m. of the metal surface, in the temp. range 270–300°, evolves 1.4–2.8 g. Pb per hr. At 450°, the amt. is 4–6 g./hr. N. Thon

Clinical data regarding damage to the eyes from smoke or fumes. Roggenkämper (Augenheilanstalt, Mülheim an der Ruhr, Ger.). *Klin. Monatsbl. Augenheilk.* 111, 172–6(1947); *Chem. Zentr.* 1947, I, 835.—Injury to the eyes by the action of smoke or fumes is discussed. It is held that the observed damage to the cornea is true chem. trauma, in which there is a disturbance of the synthesis of the protein units of the tissue, with the result that toxic substances are liberated by the disintegration of these molecules. M. G. Moore

The pathology of diseases due to the inhalation of dust. Fr. Boenke. *Med. Monatsschr.* 1, 2–6(1947); *Chem. Zentr.* 1947, I, 835.—Four principal types of anatomical changes resulting from inhalation of dust are: lymphatic

changes, tubercle formation, diffuse hardening, and cavity formation. It is assumed in agreement with Siegmund, that a diffuse dusting of the lung tissue primarily takes place. Many developments are observed in silicosis which correspond to those of tertiary pulmonary tuberculosis. The importance of the blood passages in silicosis and the various views on tubercle formation and the growth of connective tissue are discussed. Pyrolusite dust causes hardening processes. Thomas-slag pneumonia, pulmonary disorders due to Al dust, and asbestosis are discussed. Attention is called to the assocn. of silicatosis with pulmonary carcinoma, the latter almost always taking the form of carcinoma of the pavement epithelium. It is possible that, in addn. to chem. processes, the purely mech. effects of the asbestos needles are also responsible for the development of carcinoma.
M. G. Moore

Treatment of eye chemical burns. Thomas W. Nale (Union Carbide and Carbon Corp., New York, N.Y.). *Safety Eng.* 96, No. 2, 58, 63(1948).—An effective program has been developed.
Ann Nicholson Hird

Beryllium in industry (Manley) 9. Elec. resistance of insulating board (Mory) 23. Limestone deposit [manuf. of rock wool] (Messerrey) 8. *Patents:* Acetals [intermediates and solvents] (Crouzil) 10.

Dessart, A.: Chimie appliquée. Industries minérales. Bruxelles. A. De Boeck. 1947. 478 pp. Fr. 380. Reviewed in *Tech.-Wetenschap. Tijdschr.* 17, 132(1948).

Johnson, C. R.: Soil Analysis. Portland, Ore.: Northwest Drug Chem. Products Co. 1948. 16 pp. $0.50. Reviewed in *Anal. Chem.* 20, 851(1948).

Gilard, P.: Traité de physico-chimie des silicates. T. II. Le Verre. 1948. 307 pp. Fr. 305.

Removal of gaseous impurities from air. Egyesült Izzólámpa és Villamossági R.T. Hung. 129,048, Feb. 3, 1943. Air is cooled to 0° to remove water, and then fed through containers filled with finely dispersed bauxite at temps. between 0 and −62.5°; 100 kg. bauxite is enough for treating 1 million cu. m. air, and can be regenerated by heating to 150–300°. Cf. Fr. 860,336 (*C.A.* 36, 4827⁶).
István Finály

Protection against arsine. Raphael E. Granjon and Paul de Puiffe de Magondeaux. Fr. 863,981, April 15, 1941. Arsine is absorbed by an aq. compn. of $FeCl_3$ (80%, 42°Bé.), $CuSO_4$ (10% 20°Bé.) $HMnO_4$ (9%), and $HgCl_2$ (1%).
L. A. Manning

Heat-developing mixture. Józsel Nürnl. Hung. 130,843, Jan. 2, 1943. Steel chippings 60–80, MnO_2 10–20, $MnCl_2$ 10–20, $KClO_3$ 5–10, NaCl 5–10, $FeSO_4$ and(or) $CuSO_4$ 5–10, and Zn 5–10% are powd., mixed, moistened, and kept for 10 min. in a container at 50–100°. Before use, 3 parts water is added to 100 parts of the mixt. to produce heat.
István Finály

Pumice substitute. István Szegő. Hung. 131,018, Feb. 1, 1943. Fresh-water silt is mixed with carbonates, sulfides, org. substances, and other gas-developing agents and heated to 1150° to give a pumicelike mass of d. 0.3.
István Finály

Ink eradicator. Lajos Satfeld. Hung. 128,894, Jan. 2, 1942. Solid $KMnO_4$ pressed into small rods is moistened with dil. H_2SO_4 and rubbed on the ink spot; then the spot is treated with aq. H_2O_2.
István Finály

Dust-preventing agent. Sándor Vajna. Hung. 128,897, Jan. 2, 1942. Hygroscopic substances ($CaCl_2$ or $MgCl_2$ or nitrite cellulose) are mixed with fungicides (NaF, K dinitrocresolate) and sterilizing agents (polychlorobenzene).
István Finály

Hollow gel spheroids. Edmund L. Sargent (to Socony-Vacuum Oil Co., Inc.). U.S. 2,449,253, Sept. 14, 1948. Hollow spheroids having walls of gel are formed by spraying a sol in a viscous state and at a temp. above its b.p. into a gaseous atm. also at a temp. above the b.p. of the sol, or, alternately, into a body of liquid at such elevated [illegible] that portion of the formation of the hollow spheroids. The gelable sol can be prepd. by rapid mixing of 2 or more reactant solns. in a mixing nozzle, and immediately after spraying into the heated atm. In a typical operation 2 solns. were prepd.: an acid soln. contg. 3.5% H_2SO_4 (100% concn.), 7.9% con. Fe-free $Al_2(SO_4)_3.15H_2O$, and 88.6% H_2O; and a dil. water glass prepd. by mixing 44.7% H_2O with 55.3% Na silicate (28.7% SiO_2, 8.9% Na_2O). When the 2 solns. were mixed in the ratio of 137 vol. acid to 150 vol. water glass, a clear gelable hydrosol was formed, which set in less than 1 sec. to a firm hydrogel contg. 10 g. SiO_2 and Al_2O_3 per 100 g. gel. The 2 solns. were pumped in the above proportions through heated tubes to a mixing nozzle. The temp. of the sol formed in the nozzle was 143°. The viscous sol was sprayed into a tower through which air was blown. The hollow spheroids collected from the tower were washed with water to remove sol. salts, base-exchanged with $Al_2(SO_4)_3$ to replace zeolytic Na, and dried slowly at a temp. of 121–149°. The dried material was heat-treated at 593°. The product was in the form of small, hollow spheres with smooth, glossy surfaces. In mass they were found to have a d. of 0.029 g. per cc. and a very low coeff. of thermal cond.
P. J. Wilson, Jr.

Insulating gel. Edmund L. Sargent and Robert C. Wilson, Jr. (to Socony-Vacuum Oil Co., Inc.). U.S. 2,448,280, Aug. 31, 1948. The insulating material is made up of a plurality of air cells having porous walls composed of inorg. oxide gels. Diffusion through the gel walls is sufficiently slow so that it has little effect on the thermal insulating value of the material. The material is produced in a 2-step process, comprising: (1) forming a hydrosol of an inorg. oxide including SiO_2 having the inherent properties of setting to a hydrogel without change in chem. compn. after the lapse of a period of time, and of passing through the viscous stage just prior to gelation; and (2) spraying the soln. against a solid surface at a temp. in excess of the b.p. of the sol, the sol being at a temp. in excess of its b.p. at the pressure in the spray chamber and in the viscous state at the time of spraying; so that the water content of the hydrosol is vaporized and the drops expanded to bubbles which form a foamy mass on the surface, and the walls of the bubbles bond together. In a typical run a thermal insulating material was formed by diluting Na silicate with H_2O to 15% SiO_2, 4% Na_2O, and 81% H_2O by wt. The acid-alum soln. contained approx. 4.8% $Al_2(SO_4)_3$, 3.4% H_2SO_4, and 92% H_2O. The two solns. were preheated in sep. streams to 143°. They were then mixed in a nozzle and sprayed upward in a tower heated to 316° with preheated air. The mixed solns. contained about 13.5% by wt. solids, whereas the dried gel had a 92.5% solids content by wt., and a bulk d. of 2 lb. per cu. ft. The freshly formed gel did not disintegrate when allowed to stand for 6 days in water.
P. J. Wilson, Jr.

Low-methoxyl pectinic acids. Rolland M. McCready, Harry S. Owens, and Wm. D. Maclay (to the United States of America as represented by the Secy. of Agr.). U.S. 2,448,818, Sept. 7, 1948. Low-methoxyl pectinic acids are isolated from aq. solns. of extn. liquors which have been prepd. by acidic, alk., or enzymic deesterification from source materials, such as citrus peel, apple pomace, etc. The isolation is carried out by treating the soln. with a mineral acid, such as H_2SO_4, HCl, or HNO_3, so that the pH does not exceed preferably 2.0. The pectinic acid is thereby caused to ppt. in a free-acid form. It is sepd. from the acidified soln., and the excess acid removed by water washing until the pH of the acid-water wash reaches a max. of about 2.2. The washed ppt. is finally dried. In an example, 500 cc. of 1.0% soln. of com. low-methoxyl apple pectin prepd. by acidic deesterification (methoxyl content 5.1%) was poured into 100 cc. of a soln. contg. 10 cc. concd. H_2SO_4, thus causing the ppta. of the pectinic acid. The pH of the acidified soln. was about 1.5. After washing and drying the recovery was 97% of the low-methoxyl pectinic acid in the original soln.
P. J. Wilson, Jr.

1950

1949. The leaching of mineral supplements, e.g. Zn, K, As, in salt blocks is minimized by use of not more than 3% of edible mineral supplements of very limited soly. in water contg. up to 26% salt but sol. in the digestive fluids of animals. A. J. Ganz

Trace halogen salt. Joseph A. Dunn and Frank G. Miller (to General Foods Corp.). U.S. 2,489,759, Nov. 29, 1949. The leaching of added halogen supplement from salt blocks is minimized by use of not more than 3% of edible halogen supplements, e.g. Ca bromobehenate, alk. earth fluoride, dithymol diiodide, of limited soly. in water and brine. A. J. Ganz

Trace metal salt. Joseph A. Dunn and Frank G. Miller (to General Foods Corp.). U.S. 2,489,760, Nov. 29, 1949. The leaching of added metal supplements from salt blocks is minimized by use of not more than 3% of edible metal supplements, e.g. Co, Mn, or basic Cu carbonates, of limited soly. in water and brine. A. J. G.

Trace iron salt. Joseph A. Dunn and Frank G. Miller (to General Foods Corp.). U.S. 2,489,761, Nov. 29, 1949. The leaching of added Fe supplements from salt blocks is minimized by use of not more than 3% of edible Fe compds., e.g. reduced Fe, FeO, $Fe(OH)_2$, and $Fe(OH)_3$, of limited soly. in water and brine. A. J. Ganz

Sulfur salt. Joseph A. Dunn and Frank G. Miller (to General Foods Corp.). U.S. 2,489,762, Nov. 29, 1949. The leaching of added S supplements from salt blocks is minimized by use of not more than 3% of edible S compds., e.g. laxarite, thioproteia, & thiopalmitate, of limited soly. in water and brine. A. J. Ganz

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

T. H. Chilton

Economic and financial development of the chemical process industries. Robert S. Aries and John W. Spence (R. S. Aries & Assocs., New York, N.Y.). *Ind. Eng. Chem.* 42, 936–47(1950).—Economic and financial review of the growth of chem. industry. M. H. Baker

100 chemical process companies—an analysis of their financial records, 1939–1949. Anon. *Ind. Eng. Chem.* 42, 948–73(1950). M. H. Baker

Postwar record good—future bright but—. M. F. Cranz, Jr. (Mfg. Chemists' Assoc., Washington, D.C.). *Ind. Eng. Chem.* 42, 974–7(1950).—Chem. production, employment, and prices are related to those of other manufg. industries. M. H. Baker

Basic minerals—production high but reserves cause concern. C. W. Merrill, G. W. Josephson, and F. W. Hunter (U.S. Bur. Mines, Washington, D.C.). *Ind. Eng. Chem.* 42, 978–83(1950).—Production statistics for mineral and mineral fuels, 1939–1949. M. H. Baker

Inorganic chemicals—supply meets demand. Frank Talbot (Natl. Security Resources Board, Washington, D.C.). *Ind. Eng. Chem.* 42, 984–6(1950).—Growth of the industrial inorg. chem. industry, 1939 vs. 1947. Total industry cost of fuel, production of individual products, and consumption figures by industry are tabulated. M. H. Baker

Organic chemicals—production and value still expanding. J. H. Nibben (U.S. Tariff Comm., Washington, D.C.). *Ind. Eng. Chem.* 42, 990–7(1950).—Number of establishments, production workers, total wages paid, value of products shipped, 1939 vs. 1947, are indicated for org. chemicals, vegetable and animal oils, gum and wood chemicals, drugs, and pharmaceuticals. Production, quantity sold, and value of sales for a group of synthetic org. chemicals described by product and production by classes of plastics and resin materials for 1948 are indicated. Rubber supply and consumption, including exports, turpentine production and resin production, wood and gum, 1939–1949 are given. M. H. Baker

Chemical specialties—consumer demand continues to grow. F. M. Hoffheins (U.S. Dept. Comm., Washington, D.C.). *Ind. Eng. Chem.* 42, 998–1011(1950). Number of establishments, production workers, total wages paid, value of products shipped in soaps, glycerol; paints, varnishes; insecticides and fungicides; toilet preps.; essential oils; glue and gelatin; chem. specialties, general; compressed and liquefied gases; printing inks; carbon black; together with the geographical location of the paint, varnish, pigment, and allied product industries; expenditures for plant and equipment in the paint, varnish, pigment, and allied products and soap, glycerol and related product industries, costs of fuel in these industries. M. H. Baker

Chemical exports, imports off from 1947 high. C. C. Concannon (U.S. Dept. Comm., Washington, D.C.). *Ind. Eng. Chem.* 42, 1012–4(1950). Review of chemicals [illegible] 1938, 1947

Review of literature on health hazards of beryllium and its compounds. G. G. Morgis and J. J. Forbes (U.S. Bur. Mines, Washington, D.C.). *U.S. Bur. Mines, Inform. Circ. No.* 7574, 23 pp.(1950). C. W. Schuck

Studies on aerosols. IX. Enhancement of irritating effects of various substances on the eye, nose, and throat by particulate matter and liquid aerosols in connection with pollution of the atmosphere. Lucien Doucreluande, Roquell Capps, and Ellen Weaver (Stanford Research Inst., Stanford, Calif.). *Arch. intern. pharmacodynamie* 82, 385–98(1950); cf. *C.A.* 44, 1239g.—Particulate matter, such as fine carbon black particles, used motor oil (1 to 2 p.p.m.), Diesel oil (0.2 to 0.3 p.p.m.) or NaCl aerosols, is irritating to the human eye, nose, and throat, apart from the presence of gases such as SO_2 and SO_3. These aerosols increase the irritating effect of such gases. Fresh mineral-oil aerosols (300 p.p.m.) were not irritating under the exptl. conditions. These facts are discussed with reference to the "smog" over big cities. M. L. C. Bernheim

Rapid measurement of pollution rate in an atmosphere of dust—application to mines. Edmond Leclerc and André Jorissen (Univ. Liège, Belg.). *Chimie & industrie* 63, 383–6(1950).—Known and original methods for treatment of mine dusts are described. The methods vary with size of dust and speed of air current. A granulometric method of measuring dusts is described as well as the app. There are 2 types of measurement: those relating to total wt. of grains in suspension in an air current, and those concerned with the no. of grains per cc. F. S. Boig

Some results of dust investigation in silicosis research. Hermann Gessner (Eidg. Materialprüfungsanstalt, Zurich, Switz.). *Kolloid-Z.* 115, 143–55(1949).—An address. Alfred M. Pommer

Dust and the fight against silicosis. Pierre Seuillot. *Rev. ind. minérale* 33, 379–94(1945).—Methods of protection are discussed. Michael Fleischer

Mineralogical aspects of pneumoconiosis research. G. Nagelschmidt. *Research* (London) 2, 170–5(1949); *J. Am. Ceram. Soc.* 32, No. 7, *Ceram. Abstracts* 177(1949).—A review of the literature. Three different fibrotic mineralogical groups are distinguished: (1) quartz and other forms of uncombined SiO_2, (2) other silicate minerals with or without quartz, and (3) fibrous silicates, especially asbestos; the first two are discussed in more detail. There appears to be a relation between SiO_2 "soly." and fibrotic reaction. If the soly. is too high, as in silicic acid sols and gels, the material is eliminated too fast to produce fibrosis; if it is too low, as in minls. of quartz with Al or with siliceous minerals, the fibrotic reaction is retarded. Crystal structure appears to have little effect. Two conditions seem to be necessary: (a) there must be a certain surface capable of releasing SiO_2 to lung fluids and (b) the supply of SiO_2 from this surface must be main-

Processing citrus juices. Everette M. Burdick and James S. Allen (to Texsun Citrus Exchange). U.S. 2,563,705, Aug. 7, 1951. Scale-forming compds. are removed from citrus juice so that it may be concd. in an evaporator, in the production of citrus molasses, without depositing scale. The juice is made alk. with lime and heated with a submerged flame to ppt. pectin, acids, and other compds. which might form a scale. W. B. Esselen, Jr.

Thickening fruit composition. Albert C. Edgar and Orville J. Pickens. U.S. 2,563,996. The fruit is prepd. for processing. The thickening agents usually used in baking, plus sugar and spices, are well mixed, the juice is partially thickened, added to the fruit, and the fruit processed. The canned fruit is ready for immediate use in pastries, etc. The thickening agents employed are flour, gums, and starches. R. W. Elliott

Nut butter. Paul J. Mitchell, Jr. U.S. 2,562,630, July 31, 1951. The process consists of dispersing a stabilizer in nut butter at the time that it is ground, cooling rapidly, and storing at a temp. below the beta crystn. temp. Hydrogenated fats in concn. of 2–5% of the nut butter are employed as stabilizers. R. W. Elliott

Whipping composition from soybeans. Raymond S. Burnett and James E. Gunther (to Central Soya Co., Inc.). U.S. 2,489,173, Nov. 22, 1949. A stable, whipping agent of desirable odor, flavor, and color is prepd. by leaching solvent-extd. soybean flakes with water acidified to pH 4.0–5.0 to remove the bulk of sol. N-free ext., partly hydrolyzing the proteinaceous residue by the action of pepsin at 100°F. and pH 2.5, adding about 0.2% of a peptizing salt, such as NaCl or a Na phosphate, to dissolve part of the unhydrolyzed protein, removing the insol. material by filtration at about pH 3.0, adjusting the pH of the filtrate to 4.5, and drying it. E. O. Whittier

Reversible gel from soybeans. Arthur C. Becker and Paul A. Belter (to the United States of America, as represented by the Secy. of Agr.). U.S. 2,561,333, July 24, 1951. A reversible gel is prepd. by extg. an alc.-extd. proteinaceous soybean residue with water, adding to the ext. contg. 10–25% solids 30–50% alc. by vol. of the water present, heating the soln. to between 75° and boiling, and cooling to below 30°. Flavorings, seasonings, fruit, or nuts may be added as the basis of food products, including desserts. The alc. may be added in the form of spirituous liquors to produce solidified cognac or wine. The gel may be whipped either with or without the added flavorings or other materials. Cf. *C.A.* 44, 2177g. E. O. Whittier

Soluble coffee. Roger Clément. U.S. 2,563,233, Aug. 7, 1951. A process of producing sol. coffee consists of solvent-extg. ground roasted coffee, fractionating the solvent ext. by mol. distn. into sepd. aroma and fat constituents, decaffeinizing the solvent-extd. grounds, H_2O-extg. the solvent-extd. decaffeinized grounds and recombining the sepd., molecularly distd. aroma constituent with the H_2O-extd. constituent. The fatty constituent, not required in the beverage powder, is a useful edible fat. A heavier residue fat, useful for soap or other purposes, is also obtained. W. B. Esselen, Jr.

13—CHEMICAL INDUSTRY AND MISCELLANEOUS INDUSTRIAL PRODUCTS

C. L. MANTELL

Taxes and the chemical industry. World War II tax amortization revived. Robert A. Irwin (Ring Bldg., Washington, D.C.). *Chem. Eng. News* 29, 2359–72, 2437 (1951). Impact of tax structure on industrial research. Fred Olsen and T. Gaynor Blake (Olin Inds., Inc., East Alton, Ill.). *Ibid.* 2724–8. E. J. C.

The effect of government regulations on commercial chemical development. Coördination with the government. John L. Burns. *Chem. Eng. News* 29, 1716–19(1951). Chemicals and plastics. F. H. Curtman (Manufg. Chemists' Assoc., Inc., Washington, D.C.). *Ibid.* 1719–21. Pattern for coöperation. Burton B. Biggs (Munitions Board, Washington, D.C.). *Ibid.* 1721–23. Labor, capital, and materials. Wesley Lindow (Irving Trust Co., New York, N.Y.). *Ibid.* 1816–19. NPA's Chemical Division. Joseph S. Bates (Natl. Production Authority, Washington, D.C.). *Ibid.* 1820–22. NPA's role in defense. Frank R. Creedon (Natl. Production Authority, Washington, D.C.). *Ibid.* 1822–3. Chemicals in foods. Isaac Fogg (Atlas Powder Co., Wilmington, Del.). *Ibid.* 1933–5. E. J. C.

World chemical trade. C. C. Concannon (Natl. Production Authority, Washington, D.C.). *Chem. Eng. News* 29, 2612–15(1951). E. J. C.

Transportation of chemicals. Transportation by railroad. J. Robert Sproul (General Am. Transportation Corp., Chicago, Ind.). *Chem. Eng. News* 29, 2028–32(1951). Chemicals take to the road. C. Austin Sutherland (Natl. Tank Truck Carriers, Inc., Washington, D.C.). *Ibid.* 2460–3.—About transportation by truck. Seagoing chemicals. Oliver E. Bentel (Dow Chem. Co., Freeport, Texas). *Ibid.* 3529–8.—A discussion of the transportation of chemicals by ship. E. J. C.

Organization for development in a chemical company. Edward A. O'Neal. *Lectures, Monographs and Repts.* 1951, No. 2, 21.—12th Gluckstein memorial lecture. The organization of a chem. company is discussed and charts of typical administrative systems for a company and for the development departments are shown. H. L. Williams

The application of isotopes in chemical industry. Henry Seligman. *Chemistry & Industry* 1951, 724–7. E. H.

Research and development personnel in industrial laboratories. Myron J. Rand (Natl. Research Council, Washington, D.C.). *Chem. Eng. News* 29, 3604–8(1951). E. J. C.

Accident trends in the chemical industry. S. M. Mac-Cutcheon (Dow Chem. Co., Midland, Mich.). *Chem. Eng. News* 29, 3609–11(1951). E. J. C.

Organizing for disaster control. Will H. Shearon, Jr. *Chem. Eng. News* 29, 3694–7(1951).—Of interest to chem. industry. E. J. C.

Recent work on toxic war agents. BAL (British anti-lewisite). Z. M. Bacq (Univ. Liége, Belg.). *Actualités biochim.* 8, 1–48(1947).—A review with 60 references. W. C. Tobie

Diseases of the lung resulting from occupational dusts other than silica. Kenneth M. A. Perry. *Thorax* 2, 91–129(1947).—A review on the toxic and pathol. effects of dusts contg. Mn, Be, V, Os, Pt, As, Ba, Al, graphite, china clay, talc, sillimanite, mica, asbestos, and various org. materials. Many references. W. C. Tobie

Study of dusts in industrial atmospheres. VI. Photoelectric apparatus and apparatus for collection of large samples. P. F. Holt (Univ. Reading, Engl.). *Metallurgia* 44, 106–10(1951); cf. *C.A.* 45, 9187i.—H. describes the photoelec. methods of obtaining instantaneous readings which are a measure of the dustiness of the atm. App. for the collection of large samples for fundamental research purposes is also described. H. Stoertz

The problem of reduction of atmospheric pollution. I. Pollution by sulfur compounds. S. R. Craxford. *J. Roy. Sanit. Inst.* 71, 209–12(1951).—No economic process has been developed for the removal of S compds. from flue gas. Rachel Brown

The control of air pollution in the chemical industry. Marcus Sittenfield. *Chem. Eng. Progress* 47, 481–3(1951). C. L. Mantell —A review.

Eye irritation caused by Los Angeles smog. Richard D. Cadle and Paul L. Magill (Stanford Research Inst., Stanford, Calif.). *Arch. Ind. Hyg. Occupational Med.* 4, 74–84(1951).—A mixt. contg. HNO_3, SO_2, SO_3, oil, particulate lampblack, O_3, NaCl, and gasoline was considered by human subjects to simulate natural smog in odor and irritating properties. While removal of all particulate components had little effect, removal of all gaseous components eliminated eye irritation of the artificial smog. C. L. C.

Industrial radium poisoning. Helmut Roth. *Deut. med. wochschr.* 76, 776–7(1951).—Ra poisoning in contrast to many other industrial poisonings takes a course which lingers over years, is comparable in some respects to the latent phase of an infection, and occasionally causes general injury to the hardiness of the organism. Care must be devoted to the avoidance of occupational injury from radioactive substances through intensive industrial hygiene protective measures such as sufficient ventilation of the work-

7–92. The problem of dispersion of hot gases in the nosphere. O. G. Sutton (Military Coll. Sci., Shrivenm, Engl.). *Ibid.* 793–801. Stack meteorology as related power plants. Ward F. Davidson (Consolidated Edison o. of N.Y., New York, N.Y.). *Ibid.* 802–06. Air pollu- on and fog properties. Hans Neuberger (State College, a.). *Ibid.* 807–11.—The role of particles of combustion reducts as nuclei for fog formation was detd. experimentally. The micrometeorological installation of the University of Washington. Phil E. Church (Univ. of Washington, Seattle). *Ibid.* 812–14. The diffusion problem in hilly terrain. Joshua Z. Holland (U.S. Weather Bur., Oak Ridge, Tenn.). *Ibid.* 815–21. The application of meteorological control to atmospheric pollution problems. Maynard E. Smith (Brookhaven Natl. Lab., Upton, N.Y.). *Ibid.* 822–4. Discussion. *Ibid.* 824–39. R. W. Ryan

Atmospheric pollution. A group of contributions. *Meteorol. Monographs* No. 4, 55 pp.(1951). Enforcement principles and standards. J. H. Carter. *Ibid.* 1–3.—A discussion of various American cities. Meteorology applied to air-pollution abatement. C. A. Gosline. *Ibid.* 4–5.—Meteorological control is not usually economical, is applicable only to single plants in isolated areas, cannot be applied to continuous operations, and is subject to forecast errors. Meteorological influences and their application to control at the source. E. Wendell Hewson (Massachusetts Inst. of Technol., Cambridge). *Ibid.* 5–6.—A brief summary is given of methods used at Trail, British Columbia, for control of smelter fumes. Climatology and its part in pollution. Helmut E. Landsberg (Air Force Cambridge Research Center, Boston, Mass.). *Ibid.* 7–8.—A discussion. Diffusion of stack gases in very stable atmospheres. Morton L. Rasad (New York Univ., New York, N.Y.). *Ibid.* 9–14.—Dispersion is nonisotropic, in that the vertical dispersion is not as extensive as the horizontal and that there is a rapid initial dilu. of effluents in the first few meters after leaving the stack, followed by a slower dispersion (with a const. exchange coeff. only during stable atm. conditions). The source must be treated as an area source of finite concn., instead of the classical treatment as a point source of infinite concn., if concns. within 1 or 2 km. are to be detd. Statistical theory of diffusion by turbulent eddies. Glenn W. Brier (U.S. Weather Bur., Washington, D.C.). *Ibid.* 15–19. Instruments for air-pollution measurement. W. C. L. Hemeon (Ind. Hyg. Foundation, Pittsburgh, Pa.). *Ibid.* 20–3.—Included are instruments for measurement of particle size, light-obscuring effect, soiling effect, and acid-corrosion effect on materials. Microclimate factors in smoke pollution from tall stacks. Philip H. Lowry (Brookhaven Natl. Lab., Upton, N.Y.). *Ibid.* 24–9.—An analysis of the no. of smoke hrs. by wind direction, speed, and gustiness. Ground-level measurements of oil-fog emitted from a hundred-meter chimney. P. H. Lowry, D. A. Mazzarella, and M. E. Smith (Brookhaven Natl. Lab., Upton, N.Y.). *Ibid.* 30–5. Gustiness profiles in the lower layers of the atmosphere. H. F. Poppendiek (Univ. of California, Los Angeles). *Ibid.* 36–8. Air-tunnel studies of diffusion in urban areas. Hunter Rouse (State Univ. of Iowa, Iowa City). *Ibid.* 39–41.—Results are given of diffusion studies over model cities and buildings. Analyzing winds for frequency and duration. R. H. Sherlock (Univ. of Michigan, Ann Arbor). *Ibid.* 42–9. The forecasting of micrometeorological variables. Maynard E. Smith (Brookhaven Natl. Lab., Upton, N.Y.). *Ibid.* 50–5. Malcolm Rigby

Stacks for pollution control. R. S. Steinbock. *Chem. Eng.* 59, No. 5, 290(1952).—Corrections and revisions are presented for an article, *C.A.* 46, 4165e. J. C. Tallman

Carcinoma and asbestosis of the lung; report of a case. T. K. Owen (Roy. Victoria Hosp., Bournemouth, Engl.). *Brit. J. Cancer* 5, 382–3(1951).—Asbestosis of the lung was found 20 years after the patient had worked in an asbestos factory for 1 year. E. K. Weisburger

Some notes on testing industrial solvents. C. Marsden. *Chem. Products* 15, 92–5(1952).—A discussion of the problems assocd. with analytical testing. Allen Kent

Protein denaturation in soybean meal during processing. Paul A. Belter and Allan K. Smith (Northern Regional Research Lab., Peoria, Ill.). *J. Am. Oil Chemists' Soc.* 29, [illegible] (1952).—The effect of various steps in com. processing [illegible] of the meal proteins was [illegible] treating steps, deodorization and toasting, or in "Schnecken" type desolventizing. The data is pertinent to production of proteins for industrial uses, such as for adhesives, fiber spinning, etc., where water dispersibility is important. M. M. Pintar

The storage and handling of acids and cyanides. H. Saenger. *J. Electrodepositors' Tech. Soc.* 27, 23–33(1951). Robert Seegmiller

Compound helix as a catalyst carrier. N. Z. Kotelkov (Saratov Agr. Inst.). *J. Applied Chem. U.S.S.R.* 24, 223–6(1951)(Engl. translation).—Compd. helixes of Co, Fe, Al, and nichrome were coated with Pt, Pd, Al_2O_3, and various clays in an effort to increase the active area of the catalyst per unit mass. The efficiency of catalysis with this technique in the tested processes (dehydrogenation of cyclohexane, oxidation of H, dehydration of isopropyl alc.) is increased many fold over the same catalyst in pelleted form or deposited on asbestos. It is quite advantageous to use the nichrome helix, especially in research studies, since it can be heated by passing an elec. current through the wire itself. James C. Eubanks

Nonyellowing triethanolamine and its applications. W. Wolff (Anorgana U.S. Admin., Gendorf/Obb., Ger.). *Fette u. Seifen* 54, 142–3(1952).—The addn. of 1–2% H_2SO_4 to triethanolamine prevents discoloration on storage. Edward H. Sheers

Key to savings in painting costs. Robert R. Pierce (Pennsylvania Salt Manufg. Co., Philadelphia). *Chem. Eng.* 59, No. 5, 149–53(1952).—A comprehensive evaluation of costs for protective coatings in industrial plants is presented. It is concluded that a three-coat painting system resulting in a 5-mil minimum total thickness gives the required corrosion protection most economically. (Cf. *C.A.* 46, 1265d.) J. C. Tallman

Economic aspects of glycerol purification by ion-exchange methods. E. Schlenker. *Fette u. Seifen* 54, 165–7(1952).—A review. Edward H. Sheers

Magnetic and electric properties of ferroxcube materials. J. J. Went and E. W. Gorter (N. V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands). *Philips Tech. Rev.* 13, 181–93(1952).—Ferroxcube materials are ferromagnetic oxidic materials specially developed for use at high frequencies. Their suitability for such applications lies in the fact that owing to their high resistivity eddy-current losses do not as a rule occur. As regards the chem. compn. these materials belong to the group of ferrites crystg. with the spinel structure. The satn. magnetization of ferrites is closely related to their crystallographic structure. Values of the satn. magnetization found experimentally can be explained by assuming that an interaction exists between magnetic moments on crystallographically nonequiv. lattice sites, which tends to give those moments an antiparallel orientation. Although eddy-current losses do not usually occur in ferroxcube, residual losses, given by the expression $\tan\delta/\mu$, may under certain conditions be considerable. It is, therefore, highly important to know the behavior of μ' and $\tan\delta$, or of the real and the imaginary parts of the complex permeability $\mu = \mu' - j\mu''$, for all possible values of induction and of frequency. In this paper the behavior of these quantities as a function of frequency is considered both for very small and for somewhat larger values of the induction. Further, the temp. dependence of the initial permeability is discussed. The behavior of the imaginary part of the initial permeability at high frequencies is shown to bear a relationship to the ferromagnetic resonance absorption; this relationship and the behavior of the permeability in the presence of stronger fields leads to the conclusion that the magnetization process in ferrites differs from that taking place in metallic ferromagnetic materials. Finally attention is drawn to the remarkable dielec. properties of ferrites and the extra losses apt to arise therefrom (dimensional resonance). A. George Stern

Ferroxdure, a class of permanent magnetic materials. J. J. Went, G. W. Rathenau, E. W. Gorter, and G. W. van Oosterhout (N.V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands). *Philips Tech. Rev.* 13, 194–208(1952). —The material manufd. at present under the name of Ferroxdure is an oxidic ceramic material of the approx. compn. $BaFe_{12}O_{19}$. It is a magnetically hard material which does not contain any Co or Ni and which thus offers great economic advantages. It is characterized by possessing an

sorption which are independent of filtered Na load. Theresa McKee
5 references.

Study of mast-cells in human subjects with relation to atheroma, heparin and cholesterol. D. P. Ross. *Indian Heart J.* 4, 65–71(1952).—Mast cells occur in the human aorta, coronary artery, and lungs. Fewer occur in atheromatous vessels and under these conditions rupture of the cells occurs. Few mast cells occur in the lung when there is pulmonary hypertension and the pulmonary artery has undergone atheromatous changes. A large no. of mast cells occur in lung tissue when there is pulmonary tuberculosis with no atheromatous changes in the pulmonary artery. These findings suggest a close connection between mast cells, atheromatous changes, and cholesterol. It is suggested that the stress on arterial walls, which is caused by generalized or pulmonary hypertension, damages the mast cells with a subsequent reduction in heparin production; the power to rupture the globulin lipide bond then decreases. This agrees with the view that an increase in the no. of mast cells produces extra heparin and thus produces a lowered plasma cholesterol concn. Theresa McKee

Lung carcinoma caused by asbestos inhalation. Fr. Boenke (Städt. Krankenanstalten, Dortmund, Ger.). *Med. Monatsschr.* 7, 77–81(1953).—The relation between fibrotic changes caused by asbestos deposits in the lung and carcinoma is discussed. The lower lobe is the site of predilection. Characteristic are the multicentered developments of flat epithelium carcinoma. A. E. Meyer

Determination of 17-ketosteroids in acne rosacea. Rodolfo Néstor Conti and Pedro H. Magnin. *Semana méd.* (Buenos Aires) 1953, 1, 113–15.—The values found were normal in rosacea, higher in common acne, which difference is of diagnostic importance. A. E. Meyer

Altered liver function of chronic congestive heart failure. John M. Evans, Hyman J. Zimmerman, J. Grant Wilmer, Lawrence J. Thomas, and Clayton B. Ethridge (George Washington Univ., Washington D.C.). *Am. J. Med.* 13, 704–12(1952).—Impairment of the hepatic excretory capacity for Bromsulphalein was often marked, generally paralleling the severity of heart failure. Flocculation and turbidity tests were less frequently abnormal, the latter usually in assocn. with the hyperglobulinemia found in some of the patients. Serum bilirubin concns. were moderately increased in about 25% of the patients, particularly in those with higher levels of venous pressure. The serum albumin concn. was less than 3.5 g./100 ml. in 35 of 56 patients; the serum globulin was 3.5% or above in 15 of 56 patients. The impaired excretion of Bromsulphalein showed a pos. correlation with the height of the venous pressure; no significant correlation was observed with the degree of arterial O unsatn. 34 references. Barbara R. Murray

Autoimmune hemolytic disease and cryoglobulinemia associated with chronic lymphocytic leukemia. Hematologic and metabolic studies. Albert B. Craig, Christine Waterhouse, and Lawrence E. Young (Univ. of Rochester, Rochester, N.Y.). *Am. J. Med.* 13, 793–804(1952).—Reductions in the no. of circulating lymphocytes, in the size of the peripheral lymph nodes, and in the rate of red cell destruction were sustained for 9 months following administration of 1250 mg. adrenocorticotropic hormone (ACTH) in 15 days. A 2nd course of ACTH produced a less marked but still well-sustained response. The expected loss of N, P, and K occurred. 32 references. Barbara R. Murray

Observations upon the absorption of urinary constituents after ureterosigmoidostomy. The importance of renal damage. C. D. Creevy and M. P. Reiser (Univ. of Minnesota, Minneapolis). *Surg., Gynecol. Obstet.* 95, 580–96(1952).—Absorption of urinary chlorides through the mucosa of the colon after ureterosigmoidostomy can cause hyperchloremia and acidosis. Barbara R. Murray

Systemic lupus erythematosus. A review of the literature. S. William Ross and Benjamin B. Wells (Univ. of Arkansas, Little Rock). *Am. J. Clin. Pathol.* 23, 189–60 (1953).—The review includes changes in the blood chemistry and the "L.E." factor. 193 references. J. T. M.

Electrolyte equilibria in erythrocytes during diabetic acidosis. George Nichols, Jr., and Nancy Nichols (New England Deaconess Hosp., Boston, Mass.). *J. Clin. Invest.* 32, 113–20(1953).—Values for plasma and erythrocyte Na, K, and water during diabetic acidosis are compared with the values in 21 normal subjects. During acidosis, plasma base concn. was normal and plasma water decreased. Erythrocyte Na and K concns. were decreased while the water content was normal. Following therapy with insulin and 0.85% NaCl soln. the patients showed rapid clinical improvement and return of the plasma pH, bicarbonate and water to normal. Undesirable side effects were occasional hypernatremia, const. transient hyperchloremia, and hypocalcemia, which persisted several days. With treatment the erythrocytes lost no further K, but did lose water and Na. Na reaccumulated in the cells more rapidly than did K or water. In most patients, both cell water and K were lower than normal at the time of discharge from the hospital. There is a parallelism between water and base shifts in the erythrocytes and in the total cell mass during recovery from diabetic acidosis. 28 references. John T. Myers

The cholate-cholesterol relationship in clinical and experimental nephrosis. Ray H. Rosenman, Meyer Friedman, and Sanford O. Byers (Mt. Zion Hosp., San Francisco, Calif.). *J. Clin. Invest.* 32, 121–6(1953).—An excess accumulation of bile acid (hypercholatemia) was found in the blood of human subjects with nephrosis and in the blood of rats in which experi. nephrosis had been induced by injection of antirat-kidney serum when hypercholesterolemia was also present. The nephrotic rat also showed a diminished ability to rid his blood of excess injected cholate. Feeding of cholate to nephrotic rats appeared to prevent the decrease of plasma cholesterol, which usually occurred following the initial rise. John T. Myers

Pulmonary hypertension. I. Pulmonary circulatory dynamics in patients with pulmonary emphysema at rest. Paul N. C. Yu, Frank Lovejoy, Jr., Howard A. Joos, Robert R. Nye, Jr., William S. McCann, S. John Vernarelli, and Carol Goerwenour (Univ. of Rochester, Rochester, N.Y.). *J. Clin. Invest.* 32, 130–7(1953).—The degree of pulmonary hypertension varied directly with the severity of emphysema, hypercapnia, and anoxia. The O satn. of arterial blood varied inversely with the mean pulmonary artery pressure, but did not parallel the other determinants. The O tension of arterial blood did not vary predictably with any of the determinants. The CO_2 tension of arterial blood correlated closely with mean pulmonary artery pressure, total pulmonary resistance, and arteriolar resistance, but not with "pulmonary capillary" pressure. The ratio of residual vol. to total capacity varied directly with mean pulmonary artery pressure and total pulmonary resistance. The role of anoxia in the pathogenesis of pulmonary hypertension is confirmed. CO_2 retention is probably important in raising pulmonary artery pressure and in increasing pulmonary vascular resistance. 33 references. J. T. M.

The effect of thyrotropic hormone on the metabolism of radioiodine in euthyroid, hyperthyroid and acromegalic individuals. David V. Becker, J. R. Rall, Wendell Pearcey, and Rulon W. Rawson (Sloan-Kettering Inst. and Memorial Center, New York, N.Y.). *J. Clin. Invest.* 32, 149–60 (1953).—The effect of a single intramuscular injection of thyroid-stimulating hormone (TSH) on the metabolism of a tracer dose of I^{131} was studied in 3 euthyroid, 8 hyperthyroid, and 3 acromegalic patients. When administered 4–6 days after the tracer I^{131}, TSH increased the level of protein-bound I^{131} and I^{131} in the blood and of I^{131} in the urine. Methods are presented for the estn. of the total thyroid hormone discharged from the thyroid after TSH and for calcg. the total I content of the thyroid. Following a standard dose of TSH, euthyroid patients appeared to secrete more thyroid hormone than did hyperthyroid patients. The max. effect of TSH appeared in the first 24 hrs. in the hyperthyroid patients, and not until 48 hrs. in euthyroid patients. Three hyperthyroid patients demonstrated an unusual method of handling radio-I, which was characterized by a very rapid turnover rate of I by the thyroid with abnormally elevated serum protein-bound radio-I and urinary radio-I levels. 29 references. John T. Myers

Histamine sensitivity and anaphylaxis in the pertussis-vaccinated rat. Saul Malkiel and Betty J. Hargis (Northwestern Univ. Med. School, Chicago). *Proc. Soc. Exptl. Biol. Med.* 81, 689–91(1952).—Inoculation of the white rat with *Hemophilus pertussis* increased its sensitivity to histamine. Pertussis organism mixed with horse serum markedly enhanced the ability of the horse serum to later produce anaphylactic sensitivity. Richard F. Riley

Electrophoretic studies of the serum of horses infected with experimental infectious anemia. Jean Hirtz (Inst. François Nevre, Lyon, France). *Rev. immunol.* 16, 397–405(1952).—Electrophoretic studies of 4 horses in-

ur P. Phillips (Wellcome Research Labs., Tuckahoe, *Nature* 172, 867(1953).—Tertiary amines such .L. No. 51-143, 1-methyl-3(5-dimethylaminobutyl)- ne dihydrochloride possess powerful ganglionic g activity. Such tertiary amines are as potent but a toxic as hexamethonium derivs. They do not quaternary salt groups and therefore should be free y side effects assocd. with the quaternary ammonium ructure. W.R.L. No. 51-143, when injected intra- dy into dogs, blocks the autonomic ganglia and lowers ood pressure in a manner comparable to hexametho- chloride. It does not block injected adrenaline. ohar doses of W.R.L. No. 51-143, when given orally, nger than hexamethonium in lowering blood pressure. N. R. Stephenson

antitative studies of the relation between alcohol s and motor-vehicle accidents. George H. W. Lucas, Kalow, J. D. McColl, B. A. Griffith, and H. Ward h (Univ. Toronto). *Chemistry in Can.* 5, No. 11, 30–7 3).—A study of 423 accident drivers and 2015 nonac- nt drivers indicated that the hazard of accident is sig- ant when the blood alc. concn. is about 0.10%. The ard of accident when blood concns. are above 0.15% is imes that when the blood alc. concn. is 0.00–0.05%. Irving Sunshine

Dicoumarol; pharmacological and toxicological aspects. Stephen-Lewis (Univ. Witwatersand, Johannesburg, S. ica). *J. Forensic Med.* 1, 87–93(1953).—A complete armacological and toxicological review citing cases. 58 erences. Irving Sunshine

Effects of intravenous heparin on the plasma lipoproteins primary hypercholesteremic xanthomatosis and idiopathic yperlipemia. Walter F. Lever, Peter A. J. Smith, and ancy A. Hurley (Harvard Med. School, Boston). *Science* 18, 653–4(1953).—In the plasma of 5 of 7 normal patients, jection of heparin (1) caused no significant change in the lectrophoretic pattern, cholesterol (II), phospholipides III), or neutral fat (IV). All of 8 patients having primary hypercholesteremic xanthomatosis showed an abnormally high β-1 peak. Injection of 1 in 6 of 8 patients caused a de- crease in the β-1 peak with compensatory behavior in other peaks. No change occurred to III and IV, but II decreased from an av. of 444 to 417 mg. %. In 6 of 7 patients with idiopathic lipemia the α-2 peak, turbidity, II, III, and IV were high, but decreased on injection of I. J. D. Taylor

Effect of phosphorylated hesperidin and other flavonoids on the fertility in mice. R. Q. Thompson, M. Sturtevant, and O. D. Bird (Parke, Davis & Co., Detroit, Mich.). *Science* 118, 657(1953).—Fertility in mice was not affected by phos- phorylated hesperidin, dihydroquercitin, and hesperidin methyl chalcone. J. D. Taylor

The antidiuretic action of morphine. Richard C. De Bodo. *Am. J. Obstet. Gynecol.* 58, 825–8(1949).—The ad- verse conclusions of Kraushaar, *et al.* (cf. *C.A.* 44, 8505e) on De B.'s work are contested, and some new data are given. Reply by Drs. Kraushaar and Bradbury. Otto F. Kraus- haar and James T. Bradbury. *Ibid.* 827–8.—Polemic. W. C. Tobie

The action of dicumarol and its derivatives on the visual field in glaucoma. F. Morpurgo and M. Valerio. *Ann. oculist.* (Paris) 184, 545(1951); cf. *C.A.* 47, 1294e.—In glaucoma, dicumarol exerts an anticoagulating action on sclerotic and obliterative processes, improving circulation in the eye and producing an enlargement of the visual field and a reduction of scotomas. W. C. Tobie

Effect of retrobulbar anesthesia on the intraocular tension and the vitreous pressure. Harold Gifford, Jr. *Arch. Ophthalmol.* (Chicago) 43, 957–8(1950).—In the normal nonglaucomatous eye, about 33% (P_{normal}) of the total intraocular pressure (P_{total}) is controlled by the nervous sys- tem. P_{normal} can be distinguished from P_{total} by intra- orbital injection of 0.1% adrenaline-HCl or by thiopental- Na anesthesia. This leaves a residual or basal pressure (P_{total} minus P_{normal}) which increases slightly in the normal eye as intraocular pressure rises. In glaucomatous eyes, the basal pressure increases, sometimes to such an extent that all chem. and phys. tension-lowering procedures are re- sisted. Possible mechanisms of action are discussed. W. C. Tobie

The ability of Plasmodium lophurae to acquire resistance [illegible] and chloroquine. P. E. [illegible]. *Abstr.*

days old, were infected with *P. lophurae* and allowed to eat at will food contg. chlorguanide-HCl (I), Camoquin (II), chloroquine diphosphate (III), quinine-HCl (IV), pama- quine-HCl (V), or mepacrine-2HCl (VI). Passages were made by subinoculation of the blood of treated chicks twice a week using 10^6 parasites/g. body wt. On a diet contg. 0.001% II the parasites were considerably damaged, the ef- fects resembling those of III and VI. In later passages, slightly higher amts. of II were needed for the same effect on the parasites. On a diet contg. 0.002% III, no increase of resistance occurred. With 0.0016% I in the diets about 50% of the parasites were suppressed initially, but after 28 days (8 passages), 0.002% was necessary. After 60 pas- sages, 0.01% had little effect. The parasites showed grad- ual adaptation rather than sudden increases in resistance. Parasites resistant to I were sensitive to II, III, IV, V, and VI. W. C. Tobie

Pharmacology and toxicology. Irving H. Leopold (Univ. of Pennsylvania, Philadelphia). *Arch. Ophthalmol.* (Chi- cago) 44, 300–48(1950); cf. *C.A.* 46, 11423h.—A review of recent developments bearing on ophthalmology. About 200 references. W. C. Tobie

Effect of quinine treatment of the host upon the carbohy- drate metabolism of the malarial parasite, Plasmodium gal- linaceum. J. W. Moulder (Univ. of Chicago). *J. In- fectious Diseases* 83, 262–70(1948); *Abstr. World Med.* 6, 879(1949); cf. *C.A.* 44, 09144.—Chickens (1.5–2.0 kg. wt.) were infected with *Plasmodium gallinaceum* and intra- venously injected with 20 mg. quinine/kg. body wt. Me- tabolism of washed parasitized red cells was detd. before and 24 hrs. after the injections. Effects of quinine were: an increased rate of glucose utilization, a decreased rate of pyruvate utilization, a lowered O/glucose ratio, and an in- crease in O uptake upon addn. of glucose, lactate, or pyru- vate. These changes indicate that the anaerobic break- down of glucose to pyruvate is unaffected by quinine al- though the complete aerobic oxidation of pyruvate is in- hibited. The inhibition of carbohydrate metabolism is qualitatively the same *in vitro* and *in vivo*. The effect on the metabolism of the parasites is irreversible. W. C. Tobie

Prevention of benzene poisoning by hematological sur- veillance. L. Brailer and J. Bernard. *Le Sang* 20, 258–62 (1949). The benzene level in blood of subjects exposed to risk of poisoning. L. Brailer, *et al.* *Ibid.* 262–6. W. C. Tobie

Radiographic visualization of the deposition of radio- beryllium in the rat. C. T. Kaylor and C. D. Van Cleave (Univ. of N. Carolina, Chapel Hill). *Anat. Record* 117, 467–81(1953).—Three different chem. forms of carrier-free radioberylium (Be^7 as chloride, sulfate, and citrate) were administered to rats by intravenous and intraperitoneal in- jection. The only organs from which autographs could be obtained with any degree of regularity were liver, spleen, and skeleton. Kidney autographs were rarely obtained. Edward J. Van Loon

Effect of intravenously administered estrogen in cardio- vascular disease. Leo Gitman and I. J. Greenblatt (Beth- El Hosp., Brooklyn, N.Y.). *Angiology* 4, 502–9(1953).— Intravenous estrogen administered to patients with cardio- vascular disease produced a fall in the level of serum β- lipoproteins of the *Sf* 12-20 and 20-100 classes. Edward J. Van Loon

Antihemorrhagic action of butanol in advanced cancer. Emanuel Revici and Robert A. Ravich (Inst. of Appl. Biol., Brooklyn, N.Y.). *Angiology* 4, 510–15(1953).—A sat. aq. soln. of BuOH is highly effective as an antihemorrhagic agent in advanced inoperable and metastatic malignancies. It is nontoxic, nonirritating, stable, and self-sterilizing soln. and can be administered orally, intramuscularly, or intra- venously. The mode of action is not clear but appears to be related to effect exerted upon the metabolism of abnormal tissues rather than upon the clotting mechanism of the blood. Edward J. Van Loon

The nature of lesions caused by asbestos and mica in ex- perimental pneumoconiosis in guinea pigs. A. S. Ramas- wamy, D. S. Venkatesh, and R. Rama Rao (Indian Inst. Sci., Bangalore). *J. Indian Inst. Sci.* 35A, 319–31(1953).— In the case of lung, mica dust predisposes to nodular forma- tion whereas asbestos dust causes only diffuse fibrosis. Long continued exposure to these dusts produced lesions in other organs. The at. structure and nature of cleavage of the mineral is intimately related to the production of silico-

J. Kensler (Sloan-Kettering Inst., New York, N.Y.). *J. Natl. Cancer Inst.* 15, 67–72(1954); cf. *C.A.* 44, 4566i.—A series of Et deriva. of *p*-aminoazobenzene and *N*-methyl-*p*-aminoazobenzene were tested for carcinogenic activity in rats fed equimolar amts. of these compds. in a nonprotective diet of the rice type. The new compds. prepd. and their m.ps. (cor.) are: *N*-methyl-4′-methyl-*p*-aminoazobenzene (I), 70.5–1.5°; *N*-methyl-2′-ethyl-*p*-aminoazobenzene (II), 63.4–3.8°; *N,N*-dimethyl-3′-methyl-4′-hydroxy-*p*-aminoazobenzene (III), 171.2–1.6°; 3-(4-dimethylaminophenylazo)-pyridine (IV), 121.5–2.8°. With but 1 exception, the introduction of an Et group into the azo mol. decreased or abolished the ability of the parent compd. to produce liver tumors; the 4′-Et homolog of I showed high activity (100% incidence) but the activity of I was low, 20% incidence. II showed no activity but the 2′-Me homolog of II showed low activity, 27% incidence. Et substituents on the amino group decreased or abolished carcinogenic activity. IV showed only 50% of the activity of its azobenzene analog. III was inactive.
Felix Saunders

Quantitative relation between growth of Ehrlich ascites tumor and reduction of liver catalase activity. Balduin Lucké and Mary Berwick (Univ. of Pennsylvania, Philadelphia). *J. Natl. Cancer Inst.* 15, 99–112(1954); cf. *C.A.* 47, 2856*i*.—A quant. relation was established between growth of a strain of the Ehrlich ascites tumor and the rate of diminution of liver catalase. This tumor grows at a steady exponential rate during the 1st 6 days after inoculation. Thereafter, the growth rate declines, approaches a stationary state, and then enters a neg. phase. The complete growth curve of the free tumor cells has essentially the same shape as that of a culture of bacteria or other unicellular organisms in a restricted space. During the exponential phase the time required to double the tumor-cell population averaged 21.4 hrs., and to double the neoplastic mass (vol.) 25.2 hrs. For every doubling of the cell population, activity values for liver catalase diminished on the av. by 0.0416 units, and by 0.0544 units for every doubling of total tumor mass; the corresponding percentile reductions, in terms of initial catalase value, were 7.90 and 10.35, resp. Conclusion: During the exponential phase of tumor growth the inhibitors of liver catalase are elaborated and released at a steady rate by the tumor cells.
Felix Saunders

Experimental studies in metal cancerigenesis. VI. Tissue reactions in rats and rabbits after parenteral introduction of suspensions of arsenic, beryllium, or asbestos in lanolin. W. C. Hueper (Natl. Cancer Inst., Bethesda, Md.). *J. Natl. Cancer Inst.* 15, 113–29(1954); cf. *C.A.* 47, 1856*f*.—When powd. As, Be, or asbestos in lanolin was injected into the marrow cavity of the femur, pleural cavity, or paranasal sinuses of rats, there was no development of any significant no. of cancers, either at the site of deposition or remotely, causally related to the chemicals introduced. Similar neg. results were obtained with lanolin alone. The sarcoma attack rate at the site of injection for the 250 rats used stands at 0.8%, contrasting sharply with that of 30% for rats injected with Ni suspensions and 20% for rats given parenteral injections of U. Multiple pulmonary osteomas were found in 4 rats following a traumatization of the femur by the use of an elec. drill. Conclusion: under proper expl. conditions the administration of chemicals into the connective tissues of rats is a reliable method for detg. cancerigenic potentialities.
Felix Saunders

Biological studies on stable and radioactive rare-earth compounds. III. Distribution of radioactive yttrium in normal and ascites-tumor-bearing mice and in cancer patients with serous effusions. Ruth Lewin, Hiram E. Hart, Joseph Greenberg, Herta Spencer, Kurt G. Stern, and Daniel Lastio (Montefiore Hosp., New York, N.Y.). *J. Natl. Cancer Inst.* 15, 131–43(1954); cf. *C.A.* 47, 11555b.—The distribution of Y^{90}, after intracavitary administration in ionized form, was studied in normal and Ehrlich ascites-tumor-bearing mice and in terminal cancer patients. The retention of Y^{90} in the injected cavity was markedly enhanced by the addn. of Y. At low carrier levels significant amts. of Y^{90} were found in tissues distant from the injected cavity; relatively high carrier levels greatly reduced the leakage from the cavity. In view of these observations and of the favorable characteristics of Y^{90} which reduce hazards to patient and personnel, the potential usefulness of Y^{90} in the palliative therapy of carcinomatous effusions is discussed.
Felix Saunders

Glycosuria of diphtheria patients and its pathogenesis. Pio Ritossa (Univ. Perugia, Italy) and Michele Lato. *Acta Pediat. Latina* (Padua) 6, 356–67(1953).—A discussion.
C. Scandura

Lysozyme and the phagocytic power of blood in microbial diseases of sucklings. Dino Gaburro (Univ. Padua, Italy). *Acta Pediat. Latina* (Padua) 6, 936–62(1953); cf. *C.A.* 47, 4458*h*.—In 30 cases both activities appeared rather low at the beginning of the disease with an increasing curve only in cases with favorable evolution of the disease.
C. Scandura

Pyruvic acid metabolism in pathological conditions. I. Pyruvic acid of blood in diphtheria. Germano Ricci (Univ. Rome) and Franco Mingrino. *Attioni. pediat.* 4, 827–38 (1953).—In cases of pharyngeal or nasal (but not in 1 case of laryngeal) diphtheria, higher values (up to 2.83 mg. % hr.) case) of the pyruvic acid content of blood were observed, with some parallelism to the severity of the disease. II. Pyruvic acid content of blood and cerebrospinal fluid (CSF) in tetanic infection. *Ibid.* 5, 25–32(1954).—In the toxic period of the disease (6 cases), values of the pyruvic acid in the blood and CSF were 1.85–4.40 and 1.28–2.62 mg. %, resp. Recovery was assocd. with normalization of the values. III. Pyruvic acid of blood and cerebrospinal fluid in tuberculous meningitis. G. Ricci, F. Mingrino, and T. Copaitich. *Ibid.* 287–98.—In tuberculous meningitis (18 cases with recovery) high values for the pyruvic acid content of blood and CSF (1.15–2.66 and 1.40–2.13 mg. %, resp.) were observed, with normalization on recovery; cases terminating fatally showed further increases (up to 4.25 mg. % in the CSF).
C. Scandura

Cytomorphological and cytochemical alterations of leucocytes in chronic evolutive tuberculosis of the lungs. S. Perugini (Univ. Modena, Italy), P. Capra-Marzani, V. Rossi, and M. Soldati. *Arch. "E. Maragliano" patol. e clin.* 9, 459–70(1954).—Histol. observations (30–40 days) in 22 patients showed the presence of pathol. granulations, lower peroxidase and lipide, high glycogen and alk. phosphatase in neutrophil granulocytes, and an increase of polysaccharide granulations and pathol. granulations detectable by the Mommsen method and the Giemsa method in lymphocytes.
C. Scandura

Glycine of blood at fasting and after intravenous glycine administration in liver patients. III. Enrico Orlando (Univ. Bologna, Italy). *Arch. "E. Maragliano" patol. e clin.* 9, 685–90(1954).—In both conditions, values higher than normal were found, the higher the value the more severe the disease.
C. Scandura

Behavior of the butanol-soluble fraction of organic iodine of serum in normal subjects and patients with hyperthyroidism, with reference to x-ray treatment. P. F. Antognetti (Univ. Genoa, Italy) and U. Costa. *Arch. "E. Maragliano" patol. e clin.* 9, 769–74(1954).—In (1) 10 normal subjects and (2) 21 patients with hyperthyroidism, (3) 9 of them before and (4) after x-ray treatment, the org. I of serum and its BuOH-sol. fraction were (in γ/100 cc. serum): (1) 4.82 and 4.04, (2) 13.9 and 10.5, (3) 14.19 and 10.9, and (4) 11.94 and 9.01.
C. Scandura

The urinary galactose test (with and without histamine administration) in liver cirrhosis before, during, and after testosterone propionate treatment. Carlo Cei (Univ. Pavia, Italy). *Boll. soc. med. chir. Pavia* 65, 855–65 (1951).—Testosterone propionate was found to cause, in clinically improved patients, a decrease of urinary galactose in the galactose test, particularly in the cases studied some time after the hormone treatment. Histamine always enhanced the renal excretion of galactose.
C. Scandura

The adrenal cortex in operated patients. I. The curve from potassium administration and the eosinophil count. Raffaele Palomba (Univ. Sassari, Italy) and Raimondo Presti. *Gaz. intern. med. e chir.* 59, 315–27(1954).—In 18 of 31 patients the curve of blood potassium after KCl administration showed a lower peak and a more rapid drop than that before operation. Eosinophils were considerably diminished. II. Determination of urinary 17-keto steroids. Raffaele Palomba and Geronima Sotgiu. *Ibid.* 328–36.—In 16 of 19 cases an evident increase of 17-keto steroid excretion was observed during the 1st and 2nd days after operation, especially in patients in good general condition.
C. Scandura

Blood cholesterol in tuberculosis of the lungs. Giuseppe Zirilli (Univ. Rome). *Gaz. intern. med. e chir.* 58, 665–72(1953).—The study of 50 cases showed the blood cholesterol to be (1) normal, (2) higher, and (3) lower than normal, resp., in (1) patients with mild lesions under therapeutic

Heinz bodies observed in 35% of the erythrocytes in 3 of the 4 men. Examn. of 36 workers with daily $C_6H_5NH_2$ exposures with an av. concn. of 0.54 p.p.m. showed no significant abnormalities. C. L. Campbell

a Experiences with unusual materials and operations. E. C. Hyatt and M. F. Milligan (Los Alamos Sci. Lab., Los Alamos, New Mex.). *Am. Ind. Hyg. Assoc. Quart.* 14, 289–93(1953).—Problems encountered and control measures required are described for operations involving handling of As, AsH_3, $Ba(NO_3)_2$, H_3BO_3, Be, Nb, La, Ta, Tl, Th, U, chloromaleic compds., C_6H_8, cyclotrimethylene trinitramine (RDX), tributyl phosphate, and trinitrotoluene (TNT). C. L. Campbell

b Ultra-low-pressure aerosols. Francis A. Mina (Zonite Products Corp., New Brunswick, N.J.). *Modern Packaging* 27, No. 11, 176–8, 242–4(1954).—The crit. relation between alc. concn. and amt. of propellent of limited miscibility forms the basis for spraying alc.-based products to a fine degree of atomization by the use of internally produced pressures as low as 11–16 lb./sq. in. gage. Charts of pressure-temp. relations of varying concns. of Freon 114 propellent in EtOH solns. are shown. Eric Engel

c Review of literature on health hazards of metals. I. Copper. Sherman S. Pinto. *Arch. Ind. Hyg. Occupational Med.* 10, 77–8(1954). C. L. Campbell

Destruction of mineral particles and fibers in the lung after exposure to asbestos dust. J. F. Knox and J. Beattie. *Arch. Ind. Hyg. Occupational Med.* 10, 30–6(1954).—*Examn. of lungs from 27 cases with asbestos exposures showed that the greatest portion of particles were in the 5 to 25 μ range, and that in early exposure an appreciable portion was found above 25 μ in length, with this fraction decreasing after the 8th yr. following the last exposure.* C. L. Campbell

Hydrothermal treatment of synthetic asbestos. I. Treatment of the system $2NaF.CaO.3MgO.Fe_2O_3.8SiO_2$. Hajime Saito (Yamanashi Univ., Kofu). *J. Chem. Soc. Japan, Ind. Chem. Sect.* 55, 415–17(1952).—Fine flexible fibers were obtained by subjecting the crystals of $2NaF.CaO.3MgO.Fe_2O_3.8SiO_2$, obtained by the fusion process, to autoclaving at 300–350°. T. Katsurai

e Mineral content of the lungs after exposure to asbestos dust. J. F. Knox and J. Beattie. *Arch. Ind. Hyg. Occupational Med.* 10, 23–9(1954).—A study of lungs from 27 cases with histories of asbestos textile exposure for 5 to 33 yrs. showed that the mean rate of mineral-matter accumulation was 0.25 mg./g. of dried lung/yr. As survival time following the last exposure increased, the mineral content of the lung decreased, with variable rates observed. Severity of asbestotic lesions varied with the sum of the exposures and survival time rather than with mineral content of the lung. C. L. Campbell

f Some reactions between inert dusts and proteins. R. F. Hounam. *Arch. Ind. Hyg. Occupational Med.* 9, 284–90 (1954).—A study of mineral dusts including SiO_2, kaolin, asbestos, anthracite, graphite, Carborundum, slate, limestone, coal, bone ash, cement, bituminous coal, and CaO showed that dusts suspended in distd. H_2O may be coagulated by proteins such as gelatin, and blood serum and egg albumin in accordance with the residual charge of the materials. C. L. Campbell

g Notes on mica-dust inhalation. Harry Heimann (U.S. Public Health Service, Washington, D.C.), Samuel Moskowitz, C. R. Harihara Iyer, M. N. Gupta, and N. S. Mankiker. *Arch. Ind. Hyg. Occupational Med.* 8, 531–2(1953); cf. *ibid.* 8, 420–35.—On a study of 61 workers processing crude muscovite mica contg. less than 1% free SiO_2, only minimal lung markings, with no nodular or conglomerate fibrosis, were found. Dust exposures included 6–130 million particles/cu. ft. of air, av. 40, for sieving or sizing mica splittings; 44–300, av. 135, for pulverizing scrap mica; and 2–21, av. 10, for other operations. C. L. Campbell

Size determination of silica particles collected on membrane filters. W. C. Burke, Jr. (Univ. of California, Los Angeles). *Am. Ind. Hyg. Assoc. Quart.* 14, 299–302 (1953).—The particle size ranges of air-borne SiO_2 dust can be detd. by collecting dust on a sampler contg. a membrane filter, dissolving the filter in an org. solvent such as 60% Cellosolve and 40% CH_3COCH_3, and examg. the suspension in a turbidimeter. C. L. Campbell

Silicosis in mica mining in Bihar, India. Harry Heimann (U.S. Public Health Service, Washington, D.C.), Samuel Moskowitz, C. R. Harihara Iyer, M. N. Gupta, and N. S. Mankiker. *Arch. Ind. Hyg. Occupational Med.* 8, 420–35 (1953).—A study of 329 mica miners, including chem. analyses, dust counts, and phys. examns., showed that the rock dust encountered contained from 11 to 67% free SiO_2, medium 42%, and dust concns. varied from 7 to 800 million particles/cu. ft. of air. Nodular and conglomerate silicosis was found in 34.1% of exposed workers, with pulmonary tuberculosis in 18.6%. C. L. Campbell

Pneumoconiosis in the tungsten-carbide tool industry. Report of three cases. Charles W. Miller, Martin W. Davis, Alfred Goldman, and John P. Wyatt (Washington Univ., St. Louis, Mo.). *Arch. Ind. Hyg. Occupational Med.* 8, 453–63(1953).—Three men processing WC machine cutting tools developed lung markings and hyperglobinemia, as a specific reaction to exposures to materials including WC, Ta, Ti, Co, SiC_2, Al_2O_3, and diamond soot. Co is considered the causative agent of the conditions observed. C. L. Campbell

Fluctuations of breath radon in subjects seated at rest. E. J. Martin and J. K. W. Ferguson (Univ., Toronto, Can.). *Arch. Ind. Hyg. Occupational Med.* 8, 574–81(1953).—Four men with abnormally high Rn burdens were examd. seated at rest with a breath-sampling app. (cf. *C.A.* 46, 5100g) in which expired air is collected in a gasometer, transferred to a sample bottle, and the Rn content detd. with ionization chambers equipped with amplifying and counting units. The av. Rn output varied from 0.76 to 4.41×10^{-14} curies/l. of expired air and from 5.98 to 38.1×10^{-13} curies per min. of breathing. Doses of $NaHCO_3$ and NH_4Cl had no effect on these values, although heavy meals increased curies/min. in 2 of 3 subjects, and curies/l. in one of these. C. L. Campbell

d Appearance of a carcinoma following single exposure to a refrigeration ammonia-oil mixture. Report of a case and discussion of the role of co-carcinogenesis. Michael B. Shimkin (Univ. of California School of Med., San Francisco), A. A. De Lorimier, J. Russell Mitchell, and Travis P. Burroughs. *Arch. Ind. Hyg. Occupational Med.* 9, 186–93 (1954).—A single exposure to a corrosive mixt. of NH_3 and lubricating oil under pressure was responsible for the development of an epidermal carcinoma within 6 months. Previous skin contact with the same agents, the formation of a blister, the use of tannic acid and other ointments, the formation of a fistula, and the incision for the initial biopsy are included among the factors suspected as involved. C. L. Campbell

Occupational arsenic poisoning. Report of a case. May R. Mayers (State Dept. of Labor, New York, N.Y.). *Arch. Ind. Hyg. Occupational Med.* 9, 384–8(1954).—A worker incurring heavy exposures by skin contact, inhalation, and ingestion of As in the form of Paris green for 20 yrs. developed gastrointestinal disturbances, exfoliative dermatitis, trophic skin changes, chronic irritation of the eyes and upper respiratory tract, and polyneuritis. The symptoms progressed during the 15 yrs. between the last exposure and death. C. L. Campbell

h Aplastic anemia following exposure to carbon tetrachloride. Bernard Straus (Veterans Admin. Hosp., Bronx, N.Y.). *J. Am. Med. Assoc.* 155, 737–9(1954).—There were 3 fatalities in 8 patients with aplastic anemia following chronic exposure to CCl_4. In one case overt injury to the liver was also sustained. Chronic exposure to CCl_4 may result in irreversible bone-marrow damage. E. J. V. L.

i Absence of toxic manifestations in workers exposed to chlordan. Walter C. Alvarez and Samuel Hyman. *Arch. Ind. Hyg. Occupational Med.* 8, 480–3(1953).—A study of 24 men, aged 21 to 49 yrs., with occupational exposures to chlordan revealed no evidence of any damage to the liver, kidneys, skin, nervous system, and blood-forming organs. C. L. Campbell

j The engineering and medical control of a lead hazard—a plant study. Clarence C. Maloof, Harold Bayley, and Geo. W. Boylan (Div. of Occupational Hyg., Boston, Mass). *Am. Ind. Hyg. Assoc. Quart.* 15, 64–8(1954).—The Pb exposures in a plant where $2PbCO_3.Pb(OH)_2$ and $PbSiO_3$ are compounded into plastic sheets were reduced from 5.30 to 0.08 mg./cu. m. of air, 3.50 to 1.69, and 0.25 to 0.09 by the application of enclosures and exhaust ventilation. The effectiveness of these measures was demonstrated by medical findings among exposed workers. C. L. Campbell

Methyl chloride intoxication. Report of fifteen cases. Howard Hansen, N. K. Weaver, and F. S. Venable (Esso

chlorination causes an increase of II proportional to the Cl dose; its value diminishes with increasing time of contact. The bactericide power of the system increases with II; however, the value of the potential is not decisive for an effective disinfection. The reduction of bacteria, when a dose lower than I is used, takes place approx. according to the reaction rate of unimol. chem. reactions: $Z = 100(1-10^{(-Kt/a+II)})$, where Z is the no. of reduced bacteria in per cent, K is the const. of the bacteria-reduction rate, and t is the contact time of Cl with the sewage in min. The values of K depend on temp. and the Cl dose, and vary between 0.04 and 0.96. Henry W. Lawendel

Operating difficulties with fixed and floating covers on sewage digesters. Marion L. Crist. *Munic. Utilities* 92, No. 8, 38, 40, 42(1954). Ann Nicholson Hird

Removal of grit and screenings in sewage-treatment plants. G. T. O. Scott (Canadian-British Eng. Consultants, Toronto, Can.). *Munic. Utilities* 92, No. 8, 25–7, 46, 48, 50–1(1954). Ann Nicholson Hird

Fly control at a sewage-treatment plant. W. N. Wells (Sewage Treatment System, San Antonio, Texas). *Public Works* 85, No. 6, 87–8(1954).—The application of a spray of 32 lb. of 50% methoxychlor as wettable powder in 100 gal. of H_2O was more effective in controlling flies around an open sludge digester in a municipal sewage-treatment plant than a mixt. of lindane and of $C_6H_3Cl_3$. The most effective treatment consists of spraying a mixt. made by adding 2 gal. of emulsifiable liquid (contg. 50% malathion, 40% petroleum distillate, and 10% inert matter) and 2 gal. of blackstrap molasses to 100 gal. of H_2O. C. L. Campbell

Chemical studies of the proteins in activated sludge from sewage-disposal plants. Ulrich A. Corti (Eidg. Tech. Hochschule, Zurich, Switz.). *Schweiz. Z. Hydrol.* 15, 152–7(1953)(in German).—The amino acids in the HCl hydrolyzates of fresh, centrifuged, and dried sludge were studied. The following were isolated in cryst. form by Fischer's ester method via the Et and iso-Pr esters and their purities checked by 2-dimensional paper chromatography: alanine, isoleucine, leucine, methionine, phenylalanine, tyrosine, and valine. Quant. data obtained by microbiol. analysis are given for these plus arginine, glycine, histidine, lysine, serine, threonine, and cystine. Tryptophan was shown to be absent. Aspartic acid and glutamic acid were demonstrated by paper chromatography. The yield of amino acids amounted to 213.2 g. per kg. dried sludge or 30% of an ash-free basis. One lb. of activated sludge solids (from 1000 gal. sewage) has an amino-acid content qualitatively and quantitatively similar to 0.50 gal. fresh cow milk. David Lewis

Self purification in the estuaries. A. L. H. Gameson (Water Pollution Research Lab., Watford, Engl.). *Bull. centre belge etude et document eaux* (Liege) No. 24, 71–7 (1954)(in French).—This is a progress report of a study of reoxygenation of the Thames estuary from Teddington to the sea, a distance of 100 km. Satn. of dissolved O is about 87% at the Teddington weir, drops to 0% at the half-way point, and is about 90% at the entrance to the sea. Absorption coeffs. for O are studied *in situ* and in the lab. and the O absorbed in tons/day is variously computed from the relation of the absorption coeffs. with surface area, suspended solids, B.O.D., salinity, temp., tidal effects, rainfall, domestic and industrial wastes, and photosynthesis. When the study is completed, it is hoped that the effect of pollutants at any point will be able to be predicted and the method and results applied to other estuaries. M. Berk

The B.O.D.-O.C.D. relationship in a treated industrial effluent. Sumner Kaufman (American Cyanamid Co., Pearl River, N.Y.). *Water and Sewage Works* 101, 362–5 (1954).—The difference between the B.O.D. and O_2 consumed by dichromate (O.C.D.) for treated sewage depends upon and varies with the degree of treatment. When the B.O.D./O.C.D. ratio is plotted against degree of treatment, a curve resembling that found for natural stream purification is obtained. Application of the formula B.O.D. = O.C.D. $\times$ [(1 − B.O.D./O.C.D.) × O.C.D.] allows estn. of the B.O.D. value from an O.C.D. detn. C. L. C.

Biochemical oxygen demand. J. Chalupa, J. Hanušová, K. Konff, and J. Solar (Ústav hygieny, Prague). *Československ. hyg., epidemiol., mikrobiol., immunol.* 3, 185–7(1954); cf. Ruchhof, *et al.*, *C.A.* 42, 6028d.—The older methods are criticized and interfering factors reviewed. A modified [illegible] method is presented for a wider range of

The action of sewage waters from hexachlorocyclohexane production on the living organisms in water. František Šácha (Spolana, Neratovice, Czech.). *Československ. hyg., epidemiol., mikrobiol., immunol.* 3, 47–52(1954).—In satd. aq. solns. of $C_6H_6Cl_6$ (solv. 0.07–0.09% at 20°) and of $C_6H_4Cl_6$ (solv. 10^{-4} g. in 100 g. water), fish and water Articulata suffered more than bacteria. The bacterial content decreased during the first 24 hrs., and then, as a result of adaptation, increased to former values. Protozoa and algae were killed almost immediately, especially by C_6H_6.—Fish were injured in 1–4 min. In order to eliminate unfavorable action, the $C_6H_6Cl_6$ sewage waters must be dild. at least 100 times. L. J. Urbánek

Persistence of pyridine bases in polluted water. M. B. Ettinger, R. J. Ushka, and R. C. Kroner (U.S. Public Health Service, Cincinnati, O.). *Ind. Eng. Chem.* 46, 791–3(1954).—Lab. studies showed that pyridine, when mixed with polluted river H_2O, was dissimilated in 3 to 6 days owing to biol. attack, with subsequent addns. dissimilated in 1 to 3 days. Similar action was observed for 3-picoline and for 4-picoline, although organisms attacking 4-picoline apparently were absent in 4 sewage samples examd. The B.O.D. value of pyridine will not be observed unless the diln. H_2O is seeded with the proper organisms. C. L. Campbell

Waste problems in chemical and electrochemical metal treatment works. Józef Kucharski (Zakład Technol. Wody i Ściekow Politech. Warszawskiej, Warsaw, Poland). *Gaz, Woda i Tech. Sanit.* 28, 181–5(1954).—A review with 9 references. Henry W. Lawendel

Carcinogenic studies on adsorbates of industrially polluted raw and finished water supplies. W. C. Hueper (Natl. Cancer Inst., Washington, D.C.) and C. C. Ruchhoft. *Arch. Ind. Hyg. Occupational Med.* 9, 488–95(1954).—When material adsorbed on activated C from the gravity oil separator effluent from a petroleum refinery was painted on mice, it was weakly pos. in producing tumors. Similar exts. from raw H_2O polluted by various industrial wastes and from water-treatment-plant effluent were neg. C. L. Campbell

The river Tavy scheme. P. J. Stuckey. *J. Inst. Water Engrs.* 8, 303–27(1954).—To augment the water supply of Plymouth and surrounding area, a dam was constructed at the mouth of the river Tavy with tide water at the lower side. Above the dam the water was not seriously polluted by sewage of Tavistock. The water was pumped to a filtration plant, coagulated, and chlorinated and added to the present system. Edward Bartow

Determination of atmospheric contaminants. Geo. D. Clayton (U.S. Public Health Service, Detroit, Mich.). *Am. Gas Assoc., Proc. 35th Ann. Conv.* 1953, 892–923.—Methods and equipment are described for collecting and analyzing atm. contaminants consisting of either particulate matter or gases. W. I. Barnet

Air-and stream-pollution control in Harris County, Texas. Walter A. Quebedeaux, Jr. (Harris County Health Unit, Houston, Tex.). *Pub. Health Repts.* (U.S.) 69, 836–40 (1954). J. A. Kennedy

Air pollution. S. J. Davenport and G. G. Morgis. *U.S. Bur. Mines, Bull.* 537, 448 pp.(1954).—A bibliography with 2902 references and an author index. C. W. Schuck

Symposium on air pollution: an engineering job. William T. Ingram (N.Y. Univ.). *Pub. Health Repts.* (U.S.) 69, 721–4(1954). Toxicological studies. Mary O. Amdur (Harvard School of Public Health, Boston, Mass.). *Ibid.* 724–6. New Jersey's State program. William A. Munroe (N.J. St. Dept. Health). *Ibid.* 726–8. Contributions of industry. George T. Minassian (Consolidated Edison Co. of N.Y., Inc.). *Ibid.* 728–9. J. A. Kennedy

Measurement of air pollution. J. Cholak (Univ. of Cincinnati, Cincinnati, O.). *Arch. Ind. Hyg. Occupational Med.* 10, 203–9(1954).—A review. C. L. Campbell

Applications of x-ray diffraction analysis in the environmental field. D. Lennox and J. Leroux. *Arch. Ind. Hyg. Occupational Med.* 8, 359–70(1953).—The Geiger counter x-ray spectrometer can be applied to the detn. of air contaminants such as Be compds., asbestos, mica, talc, CaF_2, As_2O_3, Co, Pb, Ge, Mo, Rb, Ce, V, Zn, Zr, DDT, lindane, aldrin, dieldrin, endrin, and chlordan with the advantages of rapid identification, need for relatively small samples, and high sensitivity. The procedure also is of value in identifying components of samples collected in [illegible]

arch Inst., Tokyo). *J. Chem. Soc. Japan, Ind. Chem.* 57, 781–4(1954).—The catalytic activity of Ni on 2 of Al_2O_3 carrier was examd. for the synthesis of ethyl- e. The specific surface area and pore dimension dis- ution were measured by CO_2 adsorption and Hg re- ement, resp. H adsorption characteristics at −100 to 0° was also studied. The activity showed a max. at rox. 8% Ni content. The results indicate that the most ve Ni catalyst has an intermediate cryst. size on the ier surface. Katsuya Inouye

Connection between activity, structure, and acidity of gnesium silicate catalysts. N. A. Danilova. *Trudy st. Khim., Akad. Nauk Azerbaidzhan. S.S.R.* 13, 33–47 54)(in Russian).—MgO-SiO_2 catalysts, prepd. by co- m. (liquid glass mixed with $MgSO_4$ soln.) with different ncns. of the reactants, were examd. as to properties. hile the chem. compn. as such was substantially const. for e series, the phys. properties (apparent d., porosity) owed considerable differences, differences which were also ffected in their cracking activity in gasoline formation. he difference in activity was primarily a function of porosity. o direct relation was found between acidity and activity. Catalysts prepd. from more concd. solns. were more stable at high temp. Thus the thermal deactivation results not only from structural change by H_2O loss from a chemically bound form but also from alteration of the actual porosity. G. M. Kosolapoff

A highly active nickel hydrogenation catalyst. W. Langenbeck, H. Dreyer, and D. Nehring (Deut. Akad. Wiss., Berlin). *Naturwissenschaften* 41, 332(1954).—Highly active Ni catalysts are made by decompn. of mixed Ni and Mg oxalates. A soln. of 25 g. $Ni(NO_3)_2.6H_2O$ and 225 g. $Mg(NO_3)_2.6H_2O$ in 600 cc. water is pptd. at 80° with a soln. of 122 g. $(CO_2H)_2.2H_2O$ in 800 cc. water. The mixed crystals contain 23.9 mole % Ni oxalate and 76.1 mole % Mg oxalate. After heating 4 hrs. at 350° in a H_2 current a black pyrophoric powder results contg. Ni and undecompd. Mg oxalate. It hydrogenates 5 cc. cyclohexene in 35 cc. benzene at room temp. and atm. pressure in 15 min., one fifth the time required with Raney Ni. The rigid Mg oxalate skeleton probably contributes to the quality. B. J. C. van der Hoeven

Industrial atmosphere. V. Formaldehyde in the atmosphere of working environment. J. Roubal, J. Zdrazil, and F. Picha. *Pracovní Lékařství* 4, 283(1953); *Public Health Eng. Abstr.* 33, No. 8, 5; cf. *C.A.* 45, 2854.—The source of contamination of the air in work places where glues with a HCHO-urea base are used is to be found in the free HCHO contained in resins. Quantities of 0.56 to 1.4% of free HCHO were found in glues examd. Technicians maintain that the use of glues which do not contain free HCHO is not practicable. Where resins are produced, it is necessary to provide good ventilation. Free HCHO remains for a long time on objects stuck together with synthetic glue or coated with a resin-contg. paste. Sites where such material is worked should contain adequate ventilation. It is best to use gas masks or respirators in places where HCHO is used in spraying hides for tanning. R. D. H.

Poisoning occurring during the manufacture of bromochloromethane. T. Hirokawa, I. Yokoyama, T. Ishikawa, and A. Kurisu. *Bull. Inst. Public Health* (Tokyo) 2, No. 2, 1–3(Sept., 1952); *Public Health Eng. Abstr.* 33, No. 12, 16(1953).—Clinical descriptions of 3 cases of poisoning during manuf. of CH_2BrCl were given. No precautions were taken against extensive leakage from app. in which MeCl and MeBr were mixed to produce the required reaction producing the final product. The final product and (or) MeCl were presumed to have caused the damage to circulatory system, liver, and nervous system. R. D. H.

Mortality from lung cancer in asbestos workers. Richard Doll (Med. Research Council, London). *Brit. J. Ind. Med.* 12, 81–6(1955).—Among 105 persons who had been employed at one asbestos (I) works, and for whom the cause of death was detd. at autopsy, 18 showed lung cancer. Of these 18, 15 also showed asbestosis; these 15 had started employment in the industry before 1923 and had worked at least 9 yrs. before dust-control regulations had become effective. Among 113 men who had worked at ... they were liable to be exposed ... deaths in all, as compared with expected no. of 0.8, 7.6, and 15.4, resp.; all cases of lung cancer were assocd. with asbestosis. Conclusion: Lung cancer was a specific industrial hazard of certain I workers. The risk has become less as the duration of employment under the old dusty conditions has decreased. Marion Horn Peskin

Burton's lead line at the gums in workers affected by lead poisoning. Dario Gallo (Univ. Milan). *Med. lavoro* 46, 39–45(1955).—The various parts of the Pb seam in lead poisoning are described. A. E. Meyer

Lead excretion of lead hardeners in a modern Swedish tool factory. K. G. Rignér, S. G. Sjöberg, O. Sjöholm, and R. Vesterberg. *Nord. Hyg. Tidskr.* 1953, 41–7; *Public Health Eng. Abstr.* 33, No. 12, 11.—In lead hardeners the amount of lead in the urine was higher than that of a control group. The porphyrin contents of the urine and the basophilic-aggregate values of the blood were on the same level as those of the control group. The exposure did not cause any evident symptoms of lead poisoning. R. D. H.

Two cases of lead poisoning in stonemasons. M. Oltramare. *Z. Unfallmed. u. Berufskrankh.* 45, 282–8(1952); *Public Health Eng. Abstr.* 33, No. 10, 9(1953).—Some 50 years ago it was customary in Switzerland for many stone-built houses to be coated with layers of white lead. Pb intoxication contracted by two stonemasons in the process of renovating such buildings is described. Clinical and lab. findings for the 2 men were, resp., as follows: hemoglobin 61, 70%; blood urea 50, 44 mg./100 ml.; blood lead 140, 122 γ/100 ml.; and urinary coproporphyrin concn. 1350, 450 γ/24 hrs. R. D. H.

The content of silica in the blood and urine of workers in dust-creating industries. R. Yu. Govorchuk (Ukrain. Inst. Ind. Hyg. and Occupational Diseases). *Ber'ba z Silikozom, Akad. Nauk S.S.S.R., Sbornik Statei* 1953, 309–11.—The presence of SiO_2 up to 10 mg. % in the blood and up to 20 mg. % in the urine is to be regarded as normal. Inhalation of free SiO_2 by the lungs increases its content in the blood and urine. No parallelism was discerned between the stages of progressive lung silicosis and the SiO_2 content of the blood or urine. The erythrocyte sedimentation rate tends to increase as the SiO_2 blood content is increased. B. S. Levine

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Analysis of phenols [in industrial effluents] (Commins) 7. *Patent:* Manuf. of silicone polymers without hydrolysis (for brake systems) (Guillissen) 31.

Catalyst. Mitchell S. Bielawski (to Universal Oil Products Co.). U.S. 2,704,747, Mar. 22, 1955. A solid catalyst is manufd. by (1) mixing over 50% by wt. of a phosphoric acid, a siliceous adsorbent, and about 0.5 to 10% by wt. of a Co oxide, hydroxide, or salt; and (2) drying and calcining the resultant mixt. The catalyst prepd. in this manner is active in promoting org. reactions, such as the polymerization of olefins. P. J. Wilson, Jr.

Magnesia-calcium oxide-silica composites. Wm. A. Pardee and Geo. E. Elliott, Jr. (to Gulf Research & Development Co.). U.S. 2,706,168, Apr. 12, 1955. A MgO-CaO-SiO_2 composite contg. about 1–18% CaO is subjected to the action of satd. steam at 250–600°F. and calcined. The lower temp. is used for a low-CaO and the higher temp. for a high-CaO composite. Examples are given showing that steaming results in a composite of increased d. and catalytic cracking activity. N. E. J.

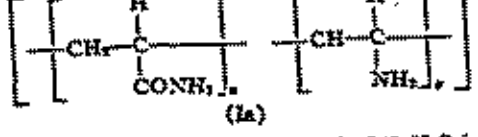
Improving the activity of chlorite solutions. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler (Hermann Baier, inventor). Ger. 826,437, Jan. 3, 1952 (Cl. 8i, 2). Salts (I) of bi- or trivalent metals, such as Cu, Al, Mg, Ca, or mixts. thereof, are added to an acid chlorite soln. (II) to improve its activity in bleaching, sterilizing, pest control, etc. The quantity of I added should amount to at least 0.01 g. Cu (preferably 0.05–0.1 g.) and at least 0.1 g. (preferably 0.5–1 g.) Mg, Al, or Ca per l. II. When II is used in bleaching fibrous materials (III), it is suitable to pretreat III with a soln. of I and then with II. The rise in activity of II is based on the fact that the quantity of ClO_2 normally developed corresponding to $4NaClO_2 + 2HCl \rightarrow 2ClO_2 + NaClO_3 + 3NaCl + H_2O$ is increased to 3 moles (from 4 moles $NaClO_2$) by the addn. of 0.1 g. Cu (as $CuSO_4$) or 0.5 g. Mg (as $MgSO_4$) per l. II (... content 3.618 g./l.) at pH 3.8 and 60°, or to 2.5 moles by the addn. of

ing and Dorothy John (administrators for the estate of Frederick G. L. Becker, deceased)(to Cellulose Development Corp. Ltd.). U.S. 2,730,426, Jan. 10, 1956. A continuous supply of moist fibrous material, dild. with H_2O during its travel, is introduced into the top and is extd. through an outlet at the bottom of a tower or chest. The treating gas, Cl, is simultaneously introduced between the top and bottom outlets so that any undissolved gas must travel upward through the descending, untreated fibrous material. The fiber concentrate may be from 10 to 40% in the first and below 10% (normally about 2-5% concn.) in the second step, the two steps being carried out in separate towers. Acidity is equiv. to 10–40 g. HCl/l. H_2O present. Time of chlorination in first stage is 10–45 min., in which time 85–90% of the total Cl demand is absorbed. The second step may last up to 2 hrs. The method may also be applied to treatment with other gases, such as ClO_2SO_4.
Blanche B. White

Alkali cellulose. Geo. A. Richter, Jr. (to American Viscose Corp.). U.S. 2,735,846, Feb. 21, 1956. A method is described for the prepn. of alkali cellulose to be used in standard viscose manuf. which eliminates the conventional steps of sheeting, steeping, pressing, and dialyzing and which requires no special equipment. Pulp chips obtained by the subdivision of pulp sheet are introduced into a shredder at 40°, and 70° NaOH soln. is added. The mass is ground for 2 hrs. at 40°; then the temp. is reduced to 15° during 1 hr. and held there for 2 hrs. The soda-cellulose crumbs of uniform compn. are stored in a churn for about 12 hrs. at 18° prior to xanthation with CS_2 and soln. in NaOH. The viscose soln. thus obtained has immediately after mixing ball-fall viscosity, fiber count, and salt test substantially the same as those for viscose produced by the conventional method. The temp. employed during initial grinding of cellulose depends on the desired rate of degradation, while the temp. used in conversion to soda-cellulose increases with increasing NaOH concn.
Blanche B. White

Improved organic esters of cellulose. Harold Bates, James W. Fisher, and John R. Smith (to British Celanese Ltd.). Brit. 737,566, Sept. 28, 1955. Cellulose acetate (I) having less than the theoretical max. acetyl value has been prepd. by ripening I made in the presence of CH_2Cl_2 or $ClCH_2.CH_2Cl_2$ as solvent and a small amt. of H_2SO_4 as catalyst. The method is also applicable to the ripening of other cellulose esters, especially to esters of aliphatic acids contg. 2–4 C atoms in the mol. A purified wood pulp (100 parts), pretreated 4 hrs. with 40 parts glacial HOAc, is introduced into a mixt. of 324 parts Ac_2O, 450 parts CH_2Cl_2, and 1 part H_2SO_4. When a clear soln. has been formed, enough H_2O is mixed in to hydrolyze all the residual Ac_2O and to provide in addn. an amt. of H_2O equal to the original wt. of cellulose. The H_2O contained enough $Mg(OAc)_2$ to neutralize the H_2SO_4. The soln. is heated to 70–80°, first under atm. pressure and then reduced pressure, until CH_2Cl_2 is 90% removed. The residual plastic mass is heated to 120° for 4 hrs. and I is ppte. by pouring into H_2O. I has a combined HOAc content of 54.8% and gives good soln. in 95% aq. acetone. Cf. *C.A.* 43, 6414*f*.
B. B. W.

Amino-aliphatic polymers for wet-strength paper. Ronald R. House, Sewell T. Moore, and Arthur M. Schiller (to American Cyanamid Co.). U.S. 2,729,560, Jan. 3, 1956. Substantive sizes for cellulosic materials are made from polyacrylamides (I) which have been converted by a Hofmann degradation with hypohalites into polymers (Ia) contg. amine groups attached to the C chain in addn. to residual amide groups. The ratio of x to y is from 1:4 to 4:1. For



(Ia)

example, a soln. of 24.6 parts NaOH in 140 H_2O is cooled below 5°, and 19.2 parts Br is added. The temp. is maintained at 0–5°. A 10% aq. soln. of polyacrylamide (71 parts) is added, and the mixt. warmed to 25° and maintained at 25–35° for 40 min. The reaction is neutralized, and the product ppte. by addn. of 34.8 parts of 37% HCl. degradation is 60–70% complete. Both unbleached and bleached Canadian kraft pulp are treated with 0.5–3.6% resin, on wt. of fiber, beaten in the usual manner, and dild. to 0.6% consistency. The sheets are couched from the wire and dried on blotting paper on a drum drier for 2 min. at 115°. In some cases, sheets are given addnl. cure for 10 min. at 127° before testing the tensile strength. The sheets which are only air-dried show a wet-strength up to 3.2 lb., regular cure up to 7.0 lb., and extra cure up to 8.3 lb.
Braham Norwick

Cigaret paper. Milton O. Schur and Robert M. Levy (to Ecusta Paper Corp.). U.S. 2,733,720, Feb. 7, 1956. Cigaret paper, having a high degree of combustibility, which burns to give a white, solid, tubelike ash, was made of flax fibers, approx. 24% $CaCO_3$ as filler, and 3% finely divided asbestos powder. It was impregnated with 0.75% $NaNO_3$ or 0.5% HCO_2Na. This paper burned 5–25% faster than those contg. no asbestos or combustion-supporting chemical.
Blanche B. White

Mineral oils containing alkoxyalkylolamine epichlorohydrin condensation products. Emilio J. Trovanello (to American Cyanamid Co.). U.S. 2,724,694, Nov. 22, 1955. A surface-active (cationic) emulsifying agent is described which is capable of producing oil-in-water emulsions of fine particle size, wherein the oil droplets are substantive to cellulose fibers, such as *paper fibers* and *cotton textiles*. For example, a mixt. of 61.7 lb. of a com. octadecylamine and 7.4 gal. of sec-BuOH was charged to a glass-lined kettle equipped with a brine-cooled condenser. These materials were heated to about 90°, and C_4H_8O (I) was passed into the kettle. After the reaction had started, the materials were cooled and temp. was maintained at 85–100°. After 11.5 hrs., the temp. was maintained at 90–100° for an addnl. 2 hrs. to insure complete reaction of the I. Thereafter, the product was stripped of solvent and volatile materials by heating to 120° under a vacuum of 20–30 mm. Hg. The product contained 3.7 moles of combined I for each mole of octadecylamine and was an orange-brown liquid at room temp. It contained 96.2% of active material. To portions of the condensation product weighing 480 g. (1 mole), there were added quantities of epichlorhydrin varying from 4.63 g. (0.05 mole) to 46.25 g. (0.5 mole), and the mixts. were heated on an oil bath for 1 hr. The resulting products were limpid, slightly viscous red-brown liquids that were sol. in mineral oils. These products were dissolved in a heavy mineral oil having a viscosity of 79 sec. at 38°. The oils were tested by pouring the oil into water at room temp., stirring 5 min., and allowing the emulsion to stand for 24 hrs. The results showed, that while self-emulsification was obtained throughout the range of 0.05–0.5 moles of epichlorhydrin per mole of amine, the optimum ratio was about 0.1–0.2 mole. Similar tests with 2.5% of the emulsifiers and 5% of the oil soln. in the emulsions showed similar results. Larger quantities of the emulsifier up to 20–30% on the wt. of the oil can be used if desired, but for most purposes this is not necessary.
Wm. J. Schepp

Impregnating multilayer paper insulation. Carl G. Munters. U.S. 2,723,923, Nov. 15, 1955. A procedure and app. are described specifically for the manuf. of multiply insulating sheets impregnated with bituminous material. Improved methods are described for recovery of the vaporizable liquid solvent or other vehicle used as a carrier for the impregnating agent.
H. Tarkow

Aqueous emulsions or dispersions for wood preservation. Mo och Domsjö Aktiebolag (I. Juliander, inventor). Swed. 152,437, Nov. 22, 1955. The emulsions and dispersions described are especially suitable as wood-preserving agents and form, if the concn. of the added cellulose ether is sufficiently high, gelatinous, thixotropic masses, the consistency of which is suitable for application on vertical surfaces. They contain 1 or more phenol derivs. of a type which are only slightly sol. or insol. in water but have phenolates which are readily sol. in water. The water phase is thickened by addn. of a water- and (or) alkali-sol. cellulose ether of the nonionic type, e.g. ethylhydroxyethylcellulose, in the presence of an alkali in an amt. which is less than that needed for sapong. the phenol deriv.
Torsten Jakobson

Carbon paper. Lucien Dumas. Fr. 990,134, Sept. 18, 1951. The transfer coating of carbon paper contains water-insol. metal salts of higher-mol. fatty acids, preferably

exhausted to the atm., while gases contg. H_2S are recycled through the combustion zone to oxidize H_2S to SO_2. The latter is absorbed in the soln. of the carbonation step to produce fresh pulping liquor. T. R. Zegree

a Continuous cooking of chips in pulp manufacture. David N. Obenshain (to West Virginia Pulp and Paper Co.). U.S. 2,789,051, Apr. 16, 1957. Chem., semichem., or high-α-cellulose pulps are produced in a continuous digester by cooking the chips with a relatively weak liquor contg. <20 g./l. of Na_2O and obtained by fortifying spent liquor from a previous pulping cycle with fresh cooking liquor. The rate of circulation of the liquor in the digester is 10–100 times greater than that of the mass of chips.
T. R. Zegree

b Coating paper or board. N. V. Cellulose Producten. *Dutch* 80,088, Jan. 16, 1956. In coating paper or board with alkali-sol. cellulose ethers, especially hydroxyethylcellulose, the cellulose ether is dissolved in alkali, an acid-resistant pigment or filler being added if desired, the soln. is applied to the paper and pptd. with an acid substance, e.g. H_2SO_4. As remaining traces of acid in the coating cause difficulties in printing, even after washing, the final traces are removed with a soln. of an alkali bicarbonate, in which the cellulose ether is not sol., and the paper is washed until c neutral and dried. N. E. Nelemans

Cigaret paper. Société Job (anciens Établissements Bardou, Job & Paulhiac). Fr. 1,009,113, May 26, 1952. A cigaret paper contg. finely divided asbestos as a burning catalyst is made by addn. of 2–5% fibrous bleached asbestos to the paper pulp. *Friedrich Epstein*

Desensitized clay-coated record sheets. Marjorie J. Cormack and Ned A. Thacker (to National Cash Register Co.). U.S. 2,777,780, Jan. 15, 1957. Parts of the receiving d sheet of a manifold system are desensitized and rendered inconspicuous by application of highly polar, colorless, nonvolatile org. compds. A typical desensitizing compn. is as follows: 50 parts oil tint base vehicle composed of a mixt. of linseed-oil varnish and resinous binders, 25 parts 2,4,4-trimethyl-2-oxazoline, and 10 parts dodecyltrimethylammonium chloride. This can be applied to the record material alone or dissolved in a volatile solvent. Cf. U.S. 2,548,366 (*C.A.* 45, 5846i). G. J. C. Potter

Transfer sheets having waxy top protective coatings with high sheen. *James W. Kordig, Gildo Fato, and Walter A. Raczynski* (to Ditto, Inc.). U.S. 2,777,781, Jan. 15, 1957. Improved transfer sheets are obtained by application to base sheets of tissue paper of a transfer coating of a waxy compn. contg. a hectograph dye, and on this coating a layer of a wax-polyethylene compn. For example, a hectograph carbon paper (I) had a transfer compn. consisting of 10–12% by wt. carnauba wax, 1–6% beeswax, and 40–60% crystal violet f dye. A compn. contg. 98% by wt. of paraffin wax and 2% A.C. Polyethylene No. 201 (a polyethylene resin of av. mol. wt. 2000) was melted and applied at 190°F. to the waxy coating. The completed sheets had a high surface sheen, showed no dye migration, and had substantially no offsetting when used in a typewriter. G. J. C. Potter

Alkaline paper resistant to microorganisms. Charles L. Moyle and Charles G. Humiston (to Dow Chemical Co.). U.S. 2,780,546, Feb. 5, 1957. Alk. paper resistant to microbial attack is obtained by formation of a paper web from a suspension of chem. or semichem. pulp contg. a pentachlorophenol compd., a molar excess of a long-chain aliphatic amine having at least 1 H attached to the amine N and a filler, the whole having a pH of 7.2–9.8. For example, to a 5% aq. suspension of unbleached sulfite pulp 2% Na pentachlorophenolate (I) by wt. of pulp was added. With continuous stirring, a 3% soln. of the hydrochloride (II) of Armeen 12D (a com. amine contg. 90% $C_{12}H_{25}NH_2$, 9% $C_{14}H_{29}NH_2$, and 1% $C_{16}H_{33}NH_2$ and having a mean mol. wt. of 185) was added in an amt. sufficient to supply 200 mole % II based on I. A powd. $CaCO_3$ filler equal to 10% by wt. of the pulp was added and the intimately mixed slurry dild. to give a stock contg. 0.2% by wt. dry pulp and having a pH of 9.0. G. J. C. Potter

Baryta-coated paper with a smooth surface. Thomas G. Hanley (to Eastman Kodak Co.). U.S. 2,780,560, Feb. 5, 1957. To obtain a smooth surface, the paper is treated with a photographically inert buffer (I) at pH 7–8 either by incorporation of I or by application to the surface. For example, I having pH 7.5 was prepd. by dissolving 96 g. citric acid (II) and 2120 g. Na_3PO_4 in 20 gal. water. It was then applied to the surface of a high α-cellulose paper by a dip-coating roll. On drying, the paper surface contained 0.8 g. Na_3PO_4 and 0.4 g. II/sq. m. of surface. A compn. comprising 1 part gelatin dissolved in 5 parts water and 10 parts $BaSO_4$ in the form of a 60% aq. suspension was dild. to 35% solids. To the soln. were added 0.67 part iso-AmOH as antifoaming agent and 0.35 part aq. HCHO. The resulting mixt. was dispersed in a colloid mill and applied to a buffered paper surface by a dip-coating roll. The coating set immediately and dried to give a smooth surface.
G. J. C. Potter

Supercalendered coated paper of high gloss. Frederick H. Frost and Robert E. Lane (to S. D. Warren Co.). U.S. 2,780,563, Feb. 5, 1957. Beater furnish (I) (1500 lb.) contained 10 lb. rosin size (dry basis), enough $Al_2(SO_4)_3$ to bring the pH to 5.5, 40 lb. clay, and a small amt. of blue dye. Paper from I was coated on 1 side only with 7 lb./ream (dry wt.) of an aq. slurry contg. 4000 lb. clay, 1200 lb. converted starch, dye, fungicide, and enough water to make a solids content of 50.6% by wt. The resulting paper was calendered and then coated on the other side with 15.5 lb./ream dry wt. of an aq. slurry having a pH of 8.95 and consisting of clay 60, $CaCO_3$ 40, and casein 16 lb. dissolved in an alk. solvent, small amts. of dye and antifoaming agents, and enough water to give a solids content of 40% by wt. The coated paper was dried, supercalendered, and wound into a roll. This roll was unwound with the last coated surface outward, passed between a rubber press roll (II) and a riding roll (III) where it was moistened with an aq. liquid (IV), and 5–6 sec. later between I and a Cr-plated heated drum (V) in contact with a pool of IV at the nip. The web was dried on the V and rolled up. IV was fed by sprays to III and V at rates of 1.2 and 4.85 gal./1000 sq. ft. of paper surface, resp. IV contained NH_3 0.084, HCHO 0.068, and monoethanolammonium stearate 0.007 lb./gal. to give a pH of 10.75. G. J. C. Potter

24—EXPLOSIVES AND EXPLOSIONS

BRUCE R. ANDERSON

Nitration and denitration of cellulose nitrates. L. G. de Bruin and C. H. D. Witte (Roy. Dutch Explosives Ltd., Amsterdam). *Commun. N. V. Konikl. Ned. Springstoffenfabrieken* 1955, No. 12, 10 pp.(in English).—At equil., nitrating acid (I) (HNO_3 21.9, H_2SO_4 61.2, H_2O 16.9%) produces a nitrocellulose that has 12.40% N and which is 100% sol. in acetone. Cotton linters were treated with I. The stabilized nitrate was retreated with I. After 4 such treatments, the N content levelled off at 12.40% and the soly. was 100%. Denitration of a nitrocellulose (13.95% N and 1% soly.) with I gave a nitrate which even after 1 year in contact with I had a N content of 12.83% (and still decreasing) and a soly. of 84% (and still increasing). If the partly denitrated (nonequil.) product is dissolved and pptd. from acetone and placed in I the equil. N content is attained much sooner. Products with the same N content obtained by denitrating with HNO_3-H_2O or by alternate denitration and ppta. from acetone have different solubilities. The mechanism of denitration is considered. Micellar-heterogeneous course of reaction is rejected. II, X-ray investigation. J. Trommel (Roy. Dutch Explosives Ltd., Amsterdam). *Ibid.* No. 13, 14 pp.(in English).—Nitrocelluloses of varying N content were prepd. by treating linters with I in which the H_2O content varied from 17 to 11%. By means of x-ray diffraction, the (101) spacings (II) were detd. In general, II increases gradually with N content, although there is definite indication of a const. spacing between 12.0 and 13.1% N. Above 13.1% N, II increases to 7.3 A. at 14.0% N. When a nitrocellulose with 14% N is partly denitrated either with HNO_3-H_2O or mixed acid, the (101) spacing of the original sample is largely retained. The samples show abnormal soly. in alc.-ether. T. proposes that both nitration and denitration proceed homogeneously; the different behavior of corresponding products with the same N content is ascribed to a difference in phys. structure.
H. Tarkow

An application of phase analysis in a nonaqueous medium.

Analgesic, antirheumatic preparation. Richard Pottier (to Union chimique belge, S. A.). U.S. 2,815,315, Dec. 3, 1957. The addn. of a deriv. of 2,3-dihydroxybenzoic acid to cortisone or hydrocortisone potentiates the effect of the cortical steroids in their therapeutic use. A typical formulation consists of 3 parts by wt. cortisone and 160 parts diacetate of 2,3-hydroxybenzoic acid. Raymond Huber

Recovery of oryzanol from rice-bran oils or rice embryos. Tomotaro Tsuchiya and Ryohei Kaneko (to Bureau of Industrial Technics). Japan. 5198('57), July 19. Rice-bran oil with acid no. of 66 is distd. *in vacuo* and the fraction b. 200° removed. The residue (100 parts) is extd. twice with 200 parts Me_2CO-MeOH (1:1) contg. a small amt. of KOH. The solvent-sol. portion is concd. to obtain 20 parts oil (I). Further extn. of I with MeOH yields 6% oil contg. 27% oryzanol, $E^{1\%}_{1cm}$ = 98 at 315 mμ. Cf. *C.A.* 49, 4897b. K. Kitsuta

Solubilization of dimethylbenzylalkylammonium chlorides. Masao Harada (to Shionogi Drug Manufg. Co.). Japan. 5200('57), July 19. Dimethylbenzyltetradecylammonium chloride (40.8 g. 90% purity) and 26.4 g. $(NH_4)_2SO_4$ is treated with H_2O at room temp., the soln. made up to 1.84 l., and filtered to obtain a clear soln. stable upon standing for 60 days. Use of one or more sulfate, sulfite, carbonate, bicarbonate, or sulfite of an alkali or alk. earth metal as a solubilizing agent is specified. K. Kitsuta

Stable injectable fat emulsions. Joseph Kalish (to Schenley Laboratories Inc.). U.S. 2,819,199, Jan. 7, 1958. Highly concd., stable, injectable, homogenized fat emulsions are prepd. from 30–55% by wt./vol. of fat, e.g., refined coconut oil, peanut oil, sesame oil, olive oil, etc., which have solidification points below body temp. and are either isotonic with human blood or, nevertheless, well tolerated, 5–10% by wt./vol. of an assimilable monosaccharide, e.g., dextrose, 0.5–3% glycerol monostearate contg. a small amt. of soap to aid in emulsification, and 2% of a polyoxyethylene-ester emulsifying agent (Tween 60). The compn. is made sterile and free from deleterious substances by treatment with adsorbent C, filtration, and heating. For example, 50 parts refined coconut oil, m. 24.4°, purified by mol. distn., 1.5 parts glyceryl monostearate (soap content approx. 1.5%), 2 parts Tween 60, 5 parts dextrose, and distd. water to make 100 parts by vol. were combined under sterile conditions and heated to boiling while stirring. The emulsion was then allowed to cool to approx. 60–70°. The globules were broken down by passing at approx. 60° through a sterilized homogenizing app., e.g., a colloid mill, while maintaining sterile conditions, recycling if necessary, until the particle size was approx. 1 μ or less and the emulsion contained no particles >2 μ. The resulting emulsion was a milky liquid, stable to oxidation and storage, and substantially unaffected by hydrolysis and (or) ionized salts. Its viscosity was 85–125 centipoises at 25°. The emulsions are suitable for intravenous injection to supply a high caloric intake in human and animal nutrition. Wm. J. Schepp

Therapeutic preparations of iron. Eric London and Gen. D. Twigg (to Benger Laboratories Ltd.). U.S. 2,820,746, Jan. 21, 1958. The prepn. consists essentially of a colloidal, substantially nonionic $Fe(OH)_3$-partially depolymerized dextran complex (I) of unknown mol. structure. Tested for intravenous toxicity in mice, I shows an LD_{50} value in excess of 600 mg./kilo and contains at least 2% elemental Fe. To 25 g. partially depolymerized dextran, dissolved in 50 ml. H_2O, was added 15 ml. NaOH in 25 ml. H_2O, followed by 40 ml. of 30% wt./vol. aq. $FeCl_3$. The mixt. was heated to boiling for 15 min., cooled to room temp., and centrifuged to remove undissolved material. The soln. was dialyzed against running H_2O for 24 hrs. in cellophane tubing. The dialyzed soln. was concd. under reduced pressure to yield I, a clear, stable soln. contg. 4.15% elemental Fe. I was filtered and autoclaved at 10 lb./sq. in. for 30 min. and had a pH of 6.8. When ferric citrate was substituted for $FeCl_3$, the mixt. was heated for 2 hrs. at 65°, filtered, and cooled. The filtrate was stirred with 95% EtOH, and the ppt. was sepd. and dissolved in H_2O. From the aq. soln., I was pptd. as above and dissolved in H_2O and concd. under reduced pressure at 45° until the soln. contained 5% Fe. Harold J. Wesselman

Dibenzylethylenediamine-penicillin V. Richard Brunner, Hans Margreiter, and Kurt Riedl (to American Home Products Corp.). U.S. 2,820,789, Jan. 21, 1958. Difficultly sol. base salts of penicillins are prepd. which maintain their activity in either acid or neutral media. Stable aq. emulsions for oral therapy can be prepd. from these salts. Thus, 3.2 g. *N,N'*-dibenzylethylenediamine-HCl in 200 ml. water was added to a soln. of 7.44 g. phenoxymethylpenicillin Na 7.44 g. (1600 units/mg.) in 200 ml. water to give 9.1 g. of the corresponding salt (87.7%), m. 105–9°, 1160 units/mg., soly. in water 0.03% at 24°. Likewise the following phenoxymethylpenicillin amine salts were prepd. (amine, % yield, water soly. at 24°, and potency in units/mg. given): phenylethylbenzylamine, 90.5, 0.09, 1016; and 2-ethoxy-6,9-diaminoacridine, 89.2, 0.11, 860. Harry D. Williams

Soluble powders, tablets, or injection solutions high in theophylline or caffeine. Chemiewerk Homburg A.-G. (Erwin Kohlstaedt, Karl-Heinz Liedtke, inventors). Ger. 873,890, Apr. 20, 1953 (Cl. 30h, 2_{06}). The use is described of solubilizers consisting of *N*-glucosides of amines having the formula NHRR', where R is an alkyl, alkanol, aralkyl, aralkanol, or aryl group and R" is alkyl radical with at least 4 C atoms, e.g., *N*-(p-glucosyl)-diethanolamine or *N*-(p-glucosyl)-(2-phenylisopropyl)amine·HCl. Cf. *C.A.* 48, 12798*a*. Karl H. Wolf

Aqueous solutions of essential oils. Chemiewerk Homburg A.-G. (Erwin Kohlstaedt and Karl H. Liedtke, inventors). Ger. 876,308, May 11, 1953 (Cl. 30h, 2_{06}). Aq. solns. are prepd. by addn. of salts of amines or acid amides with unsubstituted or ring-alkylated cyclohexyloxyacetic acids and (or) norcamphanyloxyacetic acids, including their optical isomers, as solubilizers. For infinite miscibility with water surface-active substances are added. Thus, a mixt. of menthyloxyacetic acid 8, triethanolamine 4.6, polyethylene glycol monolaurate 3.5, and water 20 was used to dissolve cineole 2, peppermint oil 1.5, *p*-tolylmethylcarbinol 4, or camphor 1.5 parts. The solns., dild. with water to 100 cc., can be further dild. to clear solns., pH 5.5–7. Karl H. Wolf

Gelatin-carboxymethylcellulose complex. Robert E. Thompson. U.S. 2,824,092, Feb. 18, 1958. Glycoprotein (I) is prepd. by combining an oxidized or oxygenated polysaccharide, i.e. carboxymethylcellulose, with a proteinaceous substance, i.e., gelatin, in an aq. soln. at a pH of 3.5–6.5. The reaction mixt. is dild. with water to ppt. the I complex which is sepd. from the soln. and dried. I is nontoxic and is useful for intravenous and intramuscular injections. T. R. Zegree

Permanently reshaping a keratin-containing substance. Hyman Henkin (to Colgate-Palmolive Co.). U.S. 2,817,342, Dec. 24, 1957. A self-setting hair-waving lotion was obtained by using a mixt. of an acid sulfite (I), urea, and urease. The cystine bond reducing and hair relaxing action of I was eliminated in time by the increase in pH produced by the action of urease on urea. Aq. solns. of an alkali metal or org. amine salt of I of pH 5.5–7.0, preferably 6.0–6.6, were used to which a previously kept separate mixt. of urea (15–25% by wt. of the waving lotion) and urease (0.3–1.5%) was added. The above amts. should be sufficient to develop in a reasonable time enough ammonia to increase the pH to 8–9. Other common additives can be added to the waving lotion. After the treatment the unwound and rinsed hair has a weakly alk. reaction which turns to its normal, slightly acid pH in a matter of days. The reconversion of the hair to an acid pH, as well as a reduction of the somewhat swollen state in which the waving lotion leaves the hair, was obtained by the application of an acid rinse of pH 2.5–6.8, with or without addn. of an oxidizing agent. B. L.

Tobacco product. Max M. Sarnfield, Brantley A. Brock, and Earl E. Locklair (to Liggett & Myers Tobacco Co.). U.S. reissue 24,424, Feb. 4, 1958. A reissue of U.S. 2,708,175 (*C.A.* 49, 11248*e*). M. L. H.

Tobacco-smoke filter. Hans T. Schreus and Fritz Schönhöfer. U.S. 2,815,760, Dec. 10, 1957. A filter which removes carbonyl compds. as well as acids and bases from tobacco smoke comprises a chamber contg. ion-exchange material and a porous substance on which carbonyl reagents have been adsorbed. Sulfonated C is a particularly effective cation-exchange material. As anion-exchange materials, the following may be used: quaternary ammonium bases of polystyrene, phenol-formaldehyde-amine resins, secondary amines derived from polystyrene, etc. To remove carbonyl compds., the following compds. which are essentially nonvolatile below 100° are adsorbed on a porous material, such as activated C, cellulose, asbestos wool, plastic chips, earthen

pellets, pumice stone, or SiO_2 gel: phenylhydrazine, semicarbazide, thiosemicarbazide, $NaHSO_3$, 1,2-amino alcs. and 1,2- and 1,3-diamines in which each amino group contains one or more unsubstituted H atoms. To neutralize the acids of smoke, org. bases, such as triethanolamine, are used with the basic carbonyl reagents. Thus, 0.5 g. cation-exchange material (Amberlite IR-120) (grain size about 1.2 mm.) was covered with a cotton-wool stopper and 0.1 g. PhOH-HCHO-amine resin (grain size 0.9 mm.). This layer was covered with a cotton-wool stopper and 0.2 g. activated C contg. 5% bis(2-hydroxyethyl)amine (grain size 1.2–1.4 mm.) was introduced. Use of 1-amino-2-ethanol and 1-methylamino-2-ethanol is also described. S. O. Jones

Reducing the nicotine content of tobacco. Heinz Thiemann and Peter Krug (to Dr. Plate, G. m. b. H.). U.S. 2,822,306, Feb. 4, 1958. An aromatic and pleasant tasting tobacco with reduced nicotine content is produced by the solvent extn. of the tobacco after the addn. of a quantity of alkali equiv. to the nicotine bound to phosphoric acid. Thus, Virginia tobacco contg. 2.94% nicotine and 1.02% phosphoric acid was leached with 6 parts by wt. of water at 45° for 1 hr. and then with water contg. 1.69% NH_4HCO_3 for 1 hr. at 55°. The exts. were combined and the nicotine was reduced by a threefold shaking with trichlorethylene to 0.2 g./l. of ext. The ext. was concd. at 20 mm. Hg until the concentrate was 28% of original wt. of tobacco, adjusted to 5.8 pH by the addn. of citric acid, and sprayed back on the extd. and dried tobacco. The resulting tobacco contained 0.53% nicotine. When made into cigarets and smoked, the cigarets were aromatic and better tasting than cigarets prepd. from untreated tobacco. S. O. Jones

18—ACIDS, ALKALIES, SALTS, AND OTHER HEAVY CHEMICALS

LOUIS KOENIG

A process for producing sulfuric acid by the method of wet catalysis. S. A. Dzhobadze and E. Rudinskii. *Gazovaya Prom.*, 1958, No. 1, 16–19.—Gases produced in the desorption of monoethylamine solns. used in purifying generator gases contg. 5.5–6.0% H_2S and 93.0–3.5% CO_2 are used for making H_2SO_4 by a modified contact process. Conversion to SO_2 takes place in a furnace provided with a layer of 46 cm. of grog packing and 150 cm. of bauxite through which the gases pass and which serve to catalyze the reaction. Emerging at temps. of 650–80° the gases are cooled to 450° in an exchanger and then passed to the acid converter provided with catalyst "BAV." The converter gases with a 2.5–3.0% SO_2 content are fixed, not by absorption in concd. H_2SO_4 but by condensation in a cooler together with steam to produce a 94% acid. Residual acid suspended in the condenser gases is removed by elec. pptn. to a concn. of not more than 0.8 g./cu.m. A drawing of the plant lay-out is included. H. L. Olin

Automatization of control and regulation of technical processes in the production of sulfuric acid and superphosphate. S. V. Kuznetsov. *Avtomatizatsiya Khim. Prom.* (Moscow: Izdatel. Akad. Nauk S.S.S.R.) *Sbornik* 1955, 16–24; *Referat. Zhur., Khim.*, 1956, Abstr. No. 18318.—GIPROKHIM (State Inst. for the Planning of Establishments of the Basic Chem. Industry) and UNIKHIM (Ural Chem. Sci. Research Inst.) carried out work on automatization (I) of certain sections of production of SO_2 in both the tower and the contact process. In connection with this was developed a device regulating the concn. of SO_2 by the method of dilu., a regulator of concn. of the monohydrate, a regulator of the oxidizing vol., an automatic photocolorimeter for detg. the NO_2 and (NO + NO_2) content in tail gases, a signalizer for acidic waste liquors and others. GIPROKHIM together with OKB (Expt'l. Design Office) of I has worked out a system of a complex I for the continuous process of production of superphosphate; the system includes a series of pieces of new equipment: a concentratometer and concn. regulator for H_2SO_4 (limits of measurements 64–70% H_2SO_4, accuracy of measurements +0.1% H_2SO_4) and a consumption meter and regulator of consumption of H_2SO_4 (limit of measurement 4–15 tons/hr., accuracy ±1.0%). J. Mloszewska

Automatization of the bubble-type absorber in the production of sulfuric acid by the contact method. L. G. Pliskin. *Avtomatizatsiya Khim. Prom.* (Moscow: Izdatel. Akad. Nauk S.S.S.R.) *Sbornik* 1955, 32–46; *Referat. Zhur., Khim.* 1956, Abstr. No. 18321.—A short description is given of a bubble-type absorber (I) as an object for regulation. The dimensions of I can be detd. by a linear differential equation with a const. coeff. and a retarded argument. For the stabilization of I, it is sufficient to regulate the temp. in the 1st gas chamber. In designing I, to simplify the regulation system, the tech. regime should be calcd. in such a way that the temp. difference at the inlet and the outlet of the chambers would be as small as feasible, and the delivery of the cooling agent into the 2nd and the following chambers 1/3 to 1/4 of that into the 1st one. J. M.

New measuring equipment for control, developed by the Ural chemical research institute. A. A. Shcherbakov. *Khim. Prom.* (Moscow: Izdatel. Akad. Khim. 1956, Abstr. No. 18320.—A review of measuring equipment, designed for the automatization of control in H_2SO_4 plants: concentration meters for strong acid and oleum (grades 93–96%, 95–99% H_2SO_4, and 15–25% free SO_3), a detector of acidity in waste waters from the cooling system, pH meters with Pb and glass electrodes (pH from 1.5 to 9.5), gas analyzers with selective absorption (SO_2, CO_2, NH_3, HCl, and others), app. of a nephelometric type for measuring turbidity of acids, photocolorimetric gas analyzers for detg. the N oxides in the waste gases from the tower system. Operation methods for this equipment are described. J. Mloszewska

Ammonia and conditions for safety in its use. N. A. Kvao. *Trudy Leningrad. Tekhnol. Inst. Kholodil. Prom.* 14, 103–10 (1956).—A review with 16 references. Werner Jacobson

Dehydration of Glauber salt by submerged combustion. L. Leśniewicz and J. Pysiak (Politechnika, Warsaw). *Przemysł Chem.* 13, 639–42(1957)(English summary).—Waste $Na_2SO_4.10H_2O$ from the rayon process was dehydrated by the submerged combustion method. During the dehydration the temp. of the soln. was 88–90°; the temp. of the waste gas was only 1–2° higher than the temp. of the soln. The waste gas did not contain any CO, although the air for combustion was used only in 8–14% excess. Heat was used in an amt. of 1250 kcal./kg. of anhyd. Na_2SO_4. The concn. of Na_2SO_4 crystals at the end of evapn. was max. 0.2 kg./l. The particle size of the crystals was: >0.5 mm. 23, 0.4–0.5 mm. 6.3, 0.3–0.4 mm. 7.8, 0.2–0.3 mm. 15.3, 0.1–0.2 mm. 34.3, and <0.1 mm. 13.3%. The original Glauber salt as it came from the rayon plant contained $Na_2SO_4.10H_2O$ >93, moisture max. 6.0, inorg. substances max. 0.2, H_2SO_4 max. 0.05, $ZnSO_4$ max. 0.03, Fe max. 0.0002, and Pb max. 0.002%. F. J. Hendel

Preparation of sodium polymetaphosphates and polyphosphates. M. Dankiewicz. *Przemysł Chem.* 13, 599–602(1957)(English summary).—D. obtained different Na polymetaphosphates (I) and Na polyphosphates (II) and tested their properties as water-softening agents. The following I were obtained: (1) Maendrell salt by dehydration of anhyd. NaH_2PO_4 (III) at 300–400° for 6 hrs., (2) Na trimetaphosphate by heating III for several hrs. at 500–600°, and (3) Na hexametaphosphate by either heating III to 625° and then melting it at 650–800°, or by mixing H_3PO_4 with a stoichiometric amt. of Na_2CO_3 and then heating the mixt. to 650° for 1 hr., or by mixing H_3PO_4 with NaOH and KOH (in stoichiometric amt.) and heating the mixt. to the melting temp. (which is 70° lower than the m.p. of pure Na metaphosphate). II were obtained by melting different mixts. of III with Na_2HPO_4 and Na_2CO_3. Na hexametaphosphate (as obtained by the first method) was the best softening agent. F. J. Hendel

Rapid conversion of anhydrite to gypsum. R. K. Leininger, Robert F. Conley, and Wayne M. Bundy (Indiana Dept. of Conserv., Bloomington). *Ind. Eng. Chem.* 49, 818–21(1957).—A detailed study is given of the effect of particle size, seeding, ratio of solid to liquid, activation, temp., agitation, and washing on the conversion of anhydrite to gypsum. Rapid conversion was found under the following conditions: The finely ground anhydrite, including some gypsum, is mixed as a slurry with a water soln. of an

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(Staff. Inst. Public Health, Utrecht, Neth.). *Rec. trav. chim.* 74, 889–96(1955)(in English).—A method is described whereby 20 mg. glycyrrhetinic acid (I)/24 hrs. urine can be detd. It is based on the fact that a soln. of I in 96% EtOH has a max. absorption at 248 mμ. With a column of Floridine earth I can be removed quantitatively from urine and freed from interfering substances. When up to 2.5 g. I was given orally in 24 hrs. it could not be detected in the urine. M. H. Neustadt

Microscopic analysis of mineral dust in lung sections. A. Policard. *Compt. rend. congr. soc. Savantes Paris et dépts., Sect. sci.* 1955, 295–301.—Particles of soot, silica, mica, kaolin, asbestos, and Fe oxide can be characterized by the use of microincineration technique and a polarizing microscope. Braham Norwick

Clinical use of the simplified Porter-Silber method for the determination of the 17-hydroxycorticosteroids in plasma. Endre Góth, L. Lengyel, and C. Sávely (Med. Dept. Margit Hosp., Budapest). *Acta Med. Acad. Sci. Hung.* 11, 227–36(1958)(in English).—Minor modifications of the Porter-Silber method (*C.A.* 44, 9504*c*) are reported for the clinical detn. of free 17-hydroxy corticosteroids in plasma. The normal range was found to be 11–26 γ/100 ml. N. S. O.

Colorimetric determination of fluorine in animal tissues with thorium-morin. Koichi Emi and Tadashi Hayami (Okayama Univ.). *Nippon Kagaku Zasshi* 78, 1532–4 (1957).—A 10 g. dry sample of animal tissue was mixed with 1.5–2.0 g. of CaO (*C.A.* 52, 3007*b*) and ignited at 700–750° for 0.5–2 hrs. The F in the residue was distd. as fluosilicic acid and detd. photometrically with Th-morin (*C.A.* 51, 12747*h*). The recovery of 1 mg. F through the entire procedure was 98.9%. H. Onishi

Enzymic determination of myoinositol. Arthur Weissbach (Natl. Insts. of Health, Bethesda, Md.). *Biochim. et Biophys. Acta* 27, 608–11(1958)(in English).—An inositol dehydrogenase obtained from *Aerobacter aerogenes* grown on a medium comprising myoinositol (I) is used for the estn. of γ amts. of I. The method is based on the reduction of diphosphopyridine nucleatide (DPN) by I in the presence of an ext. of the cells. Under the assay conditions, max. reduction of DPN by I was proportional to the I concn. At I concns. higher than 10^{-4} *M*, however, this proportionality tended to fall off. This could be accounted for, in part, by the accentuation of a DPNH oxidase system present in the bacterial ext. A no. of cyclic alcs. and sugars tested did not interfere with the assay. Morton Pader

Isolation of cynodontin (1,4,5,8-tetrahydroxy-2-methylanthraquinone) from a saltant of Helminthosporium victoriae. Ross B. Pringle (Rockefeller Inst. Med. Research, New York, N.Y.). *Biochim. et Biophys. Acta* 28, 198(1958) (in English); cf. *Phytopathology* 47, 369(1957).—The pigment of washed, dried mycelium of the red-colored variant of *H. victoriae* was extd. with $CHCl_3$. Red-bronze crystals, m. 274.5–5.0°, were obtained from the ext. These were identified as 1,4,5,8-tetrahydroxy-2-methylanthraquinone, as detd. by analysis, chem. behavior, and lack of depression of the m.p. of the natural material when mixed with the synthetic compd. Morton Pader

Preliminary fractionation of parathyroid extract with ammonium sulfate. Samuel Friedman and Paul L. Munson (Harvard Univ.). *Biochim. et Biophys. Acta* 28, 204–5 (1958)(in English).—The hormonal activity of a hot, dil. acid ext. of bovine parathyroid tissue was concd. by a method involving step-wise pptn. with $(NH_4)_2SO_4$. A considerable portion of protein with low activity could be removed from the ext., resulting in material whose specific activity was increased 3–4 fold. (The fractions were tested for biol. activity by detn. of the serum Ca 6 hrs. after subcutaneous injection into acutely parathyroidectomized rats.) The fraction pptg. at 0.3–0.4 satn. was significantly more potent than others obtained at different satns. Gradual addn. of alkali to a soln. of this fraction resulted in a ppt. which started to form at pH 5 and remained largely redissolved to pH 10. At pH 6.5, the specific activity of the ppt. was significantly greater than that of the sol. portion. The fraction was also studied by paper electrophoresis and sedimentation techniques. Morton Pader

Two-dimensional paper chromatography of higher fatty acids. Č. Michalec (Karlova Univ., Prague). *Biochim. et Biophys. Acta* 28, 212–13(1958)(in English).—In the 1st run, ascending chromatography is carried out with 93% AcOH as mobile phase, developing 5 hrs. at 20°. The chromatogram is dried at 80–90°. The 2nd chromatography is run 16–20 hrs. at −8° with 85% HCO_2H/AcOH/H_2O (50/50/5, by vol.) as solvent. The sepd. compds. are identified with $Cu(OAc)_2$ and $K_4Fe(CN)_6$ or with $Hg(OAc)_2$ and diphenylcarbazone. Application of the method to the isolation of the higher fatty acids of blood serum is described. Morton Pader

Isolation and identification of 18-hydroxyestrone from the urine of pregnant women. K. H. Loke, G. F. Marrian, W. S. Johnson, W. L. Meyer, and D. D. Cameron (Univ. Edinburgh, Scot.). *Biochim. et Biophys. Acta* 28, 214 (1958)(in English); cf. *C.A.* 52, 2220*e*.—The identification of the Kober chromogen KC-6A as 18-hydroxyestrone was confirmed by chem. comparison with synthetically prepd. material. Morton Pader

Description of a dialyzer. René J. Girerd (Frank W. Horner Ltd., Montreal, Can.). *Rev. can. biol.* 16, 418–20 (1957)(in English).—The unit is composed essentially of a coiled cellophane tube through which water flows and which, in turn, is immersed in the liquid to be dialyzed. The latter is stirred with an elec. motor and stirrer placed in the axis of the coils. Though completely stainless, the unit is best stored by rinsing, inverting, and allowing to dry. It was used mainly for protein prepns. and was found to be very fast in operation due to the combination of a large membrane surface and const. movement of the 2 liquids always presenting max. difference in ionic strength. A. Papineau-Couture

Urinary osmolar concentration in the hydropenic state as a measure of renal tubular function: a test for early renal impairment. Martin N. Frank, Leonard S. Dreilus, Fred Rarick, and Samuel Bellet (Univ. of Pennsylvania, Philadelphia). *Am. J. Med. Sci.* 233, 121–5(1957).—The max. urinary total solute concn., detd. during the hydropenic state by the method of *f.p.* depression, showed no correlation with urinary sp. gr. The lack of correlation was attributed to the fact that various solutes, protein, sugar, temp., pH, and other factors contribute differently to the sp. gr. and the osmotic pressure. Among 32 normal subjects, 27 patients with essential hypertension, 13 with diabetes mellitus, and 7 with compensated rheumatic heart disease, those capable of elaborating urinary concns. of 800 milliosmols/l. or more were considered to have adequate renal function, those with 600–800 good function, those with 400–600 fair function, and those with 400 or less, severe renal disease. Patients with essential hypertension and diabetes mellitus showed a decrease in concentrating function, as measured by this method, before alteration of other urinary function tests or clinical suspicion of urinary disease. The test may serve as a graded quant. method of evaluating renal tubular function, and in following the course of renal disease, especially in patients with minimal tubular impairment. Marion Horn Peskin

Sulfonamide blood-level determination in diabetics. Arno Hanusch and Dietfried Jorke (Univ., Jena, Ger.). *Arztl. Forsch.* 11, 451–61(1957).—Measurements of sulfonamide and sugar blood levels in diabetics after oral administration of 1-sulfanilyl-3-butylurea (I) indicate that a sulfonamide threshold blood level exists, at which level the diabetic metabolism is kept in balance. This threshold varies according to renal function. The oral maintenance dose of I is the dose needed to hold the sulfonamide blood level within the threshold limits. The relation between oral dose of I and blood sulfonamide level does not appear to be a function of age. L. A. Pursglove

Trichloroacetic acid and tolylsulfonic acids in deproteination of human blood serum. Dimitrie A. Iacovescu, Petra Ionescu, and Maria Macavei. *Comun. acad. rep. populare Romîne* 7, 845–51(1957).—Cl_3CCO_2H (I) and tolylsulfonic acid (II) can vary the degree of the H_2SO_4 digestion of protein-free filtrate thus changing the analysis of the nonprotein N. II, Se, $CuSO_4$, and H_3PO_4 enhance the digestion, yielding high values of nonprotein N. I and K_2SO_4 hinder the digestion especially at 20% concn., thus yielding low values of nonprotein N. Krikor L. Reisian

Trichloroacetic acid, metaphosphoric acid, and phosphotungstic acid influence on digestion after deproteination of human blood serum. Dimitrie A. Iacovescu and Maria Macavei. *Comun. acad. rep. populare Romîne* 7, 941–7 (1957).—The chem. nature and the quantities used of the deproteinization agents in soln. influence the H_2SO_4 digestion of the deproteinized serum, thus changing the analysis of the total N level. Cl_3CCO_2H and phosphotungstic acid hinder the digestion, leading to low N values, whil

isolated calf thymus nuclei was dried on a gelatin-coated microscope slide, covered with the test serum, washed with isotonic buffered saline (pH 7.0), and exposed to fluorescent antihuman globulin; and exmd. In pos. tests (interaction between nuclei and globulin) bright green fluorescent nuclei a were noted. Serums from 27 of 28 lupus erythematosis patients was pos. Other pos. results were obtained with serums from patients with rheumatoid arthritis, allergic drug reactions, scleroderma, and dermatomyositis. No fluorescent nuclei were noted in serums of other diseases.
W. J. Frajola

Inorganic carcinogens. C. Stuart Patterson and John R. Sampey (Furman Univ., Greenville, S.C.). *Am. J. Pharm.* 129, 434–44(1957).—The present paper reviews 200 investi- b gations on the carcinogenic action of inorg. agents. More than one-half of these reports deal with the cancer-inducing or cancer-promoting action of radioactive isotopes and other inorg. reactions. Among the nonradioactive inorg. chemicals the largest no. of investigations have been made with compds. of Cr (23 reports), Be (18), As (13), asbestos (12) and Si (9). 200 references.
W. G. Gaessler

Antidiuretic and diuretic activities of the urine and blood after bleeding of the normal dog. F. Stephan, H. Jahn, and J. Stahl (Fac. méd., Strasbourg, France). *Compt. rend. soc. biol.* 151, 1680–3(1957).—Tested by the method of Eisen and Lewis (*Lancet* 11, 361(1954)), urine collected 1 hr. after severe bleeding had marked antidiuretic activity; that collected 6.5 hrs. after bleeding was inactive; and that collected 10–24 hrs. after bleeding had considerable diuretic activity. Tested by the method of Arnes, *et al.* (*C.A.* 44, 7967i), blood samples drawn a few min. after the bleeding were strongly antidiuretic and samples drawn several hrs. later showed diuretic activity.
L. E. Gilson

Tetramethylrhodamine as an immunohistochemical fluorescent label in the study of chronic thyroiditis. Raymond Hiramoto, Karl Engel, and David Pressman (Roswell Park Mem. Inst., Buffalo, N.Y.). *Proc. Soc. Exptl. Biol. Med.* 97, 611–14(1958).—The prepn. of tetramethylrhodamine isocyanate, a new fluorescent label for certain proteins, is described. It fluoresces orange and is of particular value for staining tissues which show a green autofluorescence similar to fluorescein fluorescence even when unstained. Serum from a patient with chronic thyroiditis was shown to combine with normal thyroid tissue in the colloid region and perhaps in the glandular epithelium, while normal human serum showed no such staining. Thyroid tissue from a patient with chronic thyroiditis, infiltrated with lymphocytic cells, was stained by rabbit antibody to human globulin in the region occupied by the infiltrating cells. Normal lymph nodes showed no such staining. This indicates that the infiltrating cells contained human globulin and may have been important in the destruction of the thyroid during the course of the disease.
L. E. Gilson

Biological activity of soluble antigen–antibody complexes. I. Skin reactive properties. Kimishige Ishizaka and Dan H. Campbell (California Inst. of Technol., Pasadena). *Proc. Soc. Exptl. Biol. Med.* 97, 635–8(1958).—Preliminary. Immediate skin reactions were obtained in normal guinea pigs by intradermal injections of sol. antigen–antibody complexes. Immediate skin reactions were also obtained by injection of an electrophoretically sepd. component of serum from immunized or normal rabbits. The possible mechanism of the action is discussed.
L. E. Gilson

Plasma keto steroid in adrenal-tumor-bearing mice. Wayne Poore and Vincent P. Hollander (Univ. of Virginia Med. School, Charlottesville). *Proc. Soc. Exptl. Biol. Med.* 97, 644–6(1958).—A transplantable adrenal mouse carcinoma elevated plasma keto steroids in the host. Non-tumor-bearing mice subjected to gonadectomy plus adrenalectomy have negligible levels of plasma keto-steroids. The tumor-bearing mice have unchanged plasma levels following this procedure; this indicates steroid production by the tumor. Corticotropin and 9α-fluorohydrocortisone have no influence on the plasma keto steroid level of the tumor-bearing mice. Distant metastases were found in adrenalectomized-gonadectomized males and adrenalectomized females, but not in mice not subjected to these procedures.
L. E. Gilson

Inhibition of glucose uptake by acidosis in vitro. Terence A. Rogers (Univ. of Rochester, Rochester, N.Y.). *Proc. Soc. Exptl. Biol. Med.* 97, 646–7(1958).—Glucose uptakes of rat diaphragms *in vitro* were compared at pH 7.4 and 6.8. The acid medium inhibited glucose uptake but the degree of inhibition could be decreased by adding insulin to b media. At insulin concns. above 0.08 I.U./cc. the gluc uptake was the same at either pH. With 0.008 I.U./ of insulin a pH of 7.1 was almost as inhibitory as pH 6 There was no enhancement of glucose uptake at pH 7.8.
L. E. Gilson

Urinary aldosterone in human arterial hypertensio Jacques Genest, Erich Koiw, Wojciech Nowaczynski, a Gilles Leboeuf (Hôtel-Dieu Hosp., Montreal, Can *Proc. Soc. Exptl. Biol. Med.* 97, 676–9(1958); cf. *C.* 51, 7591d, 13050c.—Exptl. results indicated increased ald sterone excretion in about 55% of patients with arterial h pertension, and a very significant difference between me aldosterone excretion of patients with essential, renal, malignant hypertension as compared with normal subject A much greater degree of fluctuation in serial daily ald sterone detns. was observed in 2 early asymptomatic hype tensive patients as compared with a normal subject. The observations provide addnl. evidence for an adrenal cortic disturbance in hypertensive cardiovascular disease. It uncertain at the present time if these findings play a etiological role in pathogenesis of arterial hypertensio They may provide an explanation for the successful use salt depletion by chlorothiazide and mercurials in treatme of hypertension.
L. E. Gilson

Curarizing action of the plasma and extract of the thymu of a myasthenia gravis patient. Armando Octávio Rame (Univ. São Paulo, Brazil). *Rev. brasil. biol.* 18, 93–10 (1958).—The patient's plasma was capable of causing ne romuscular blockade when 1–2 cc. was injected intraarter ally into cats during the phase of decurarization produced b dimethylbebeerine (50–200 γ intraarterially). Removal the thymus (wt. 7 g.) did not alter the curarizing activity the plasma. An ext. of the thymus, in dose equiv. to 70 mg. of fresh tissue, flattened the myograph tracing when ad ministered to cats in the same way as the plasma. Prostig mine did not antagonize the action of the plasma or th thymus ext.
L. E. Gilson

Complement. G. Cavallo (Univ. Naples). *Scientia* (Milan) 93, 105–10(1958)(in Italian).—Some characteristic of serum complement and its 4 constituents are discussed.
L. E. Gilson

Abnormal hemoglobins in relation to sickness. Linu Pauling (California Inst. of Technol., Pasadena). *Rend ist. super. sanità* 21, 30–48(1958); cf. *C.A.* 50, 17108c.—A lecture (given June 13, 1956 at the Ist. Super. Sanità).
Henry A. Goldsmith

Salivary sodium, potassium, and chloride levels in subjects classified as to dental caries experience. Ira L. Shannon (Randolph Air Force Base, Tex.). *J. Dental Research* 37, 401–6(1958).—In a group of 537 men divided into carious, resistant, and restored groups no significant group differences occurred in vol. of saliva secreted in 5 min. or in mean K level. The mean Na level was significantly lower in the resistant group; the other groups showed no significant differences. The Cl^- mean value was significantly lower in the resistant group than in the other groups. Predictability of an individual's dental status, based on his salivary vol. and its Na, K, and Cl content, would be extremely low. Although significant differences were found when the means for the 3 groups of subjects were compared, there was an extensive overlap in values for individuals throughout the 3 groups. 18 references.
J. S. Hepburn

Relation of thyroid activity to the dental caries experience in mice. Joseph C. Muhler and William G. Shafer (Indiana Univ., Bloomington). *J. Dental Research* 37, 451–2(1958). —Administration of thiouracil to weanling mice in the same amts. as produced an increase in dental caries in rats did not induce that disease in the mice, even when sucrose, fine corn meal, or ground corn were included in the ration.
Joseph S. Hepburn

Interference by human and bovine serum and serum protein fractions with the absorption of antibodies by suckling rats and mice. F. W. R. Bramwell, R. Halliday, and I. G. Morris (Univ. Coll. N. Wales, Bangor). *Proc. Roy. Soc.* (London) B149, 1–11(1958).—In suckling rats and mice, antibodies pass into the circulation from orally administered immune serum. When this immune serum is mixed with serum of certain species (man, ox, and rabbit) interference occurs; i.e., absorption of antibodies is reduced relative t similar admixts. with homologous nonimmune serum. Th γ-globulin fraction of either human or bovine serum a concns. in buffered saline approx. equal to those in serum

Protection of hydrocyclones from corrosive-erosive destruction. V. S. Burlakov. *Tsvetnye Metally* 31, No. 5, 14–20(1958).—A method is described for the rubber-lining of hydrocyclones. Four rubber mixts. were tested for wear- and corrosion resistance in H_2SO_4, HCl, HNO_3, and $KClO_3$. The best compn. was, in parts by wt., low-temp. polymerized butadiene-styrene rubber SKS-30A 100, S 2, Altax 0.8, diphenylguanidine 0.8, ZnO 3, rosin 1.5, vegetable oil 6.8, diphenylguanidine 0.8, ZnO 3, rosin 1.5, vegetable oil 6.8, fatty acids 1, mazut 5, channel C black 30, and oven C black 30. E. M. Elkin

Slide rule for the computation of titration curves. Jiří Čeleda (Univ. Prague). *Chem. průmysl* 8, 173–5(1958); cf. *C.A.* 52, 14407g.—A slide rule is described for the rapid calcn. of theoretical titration curves in solns. contg. several acids and bases. The rule consists of 6 mobile sliders and a fixed pH scale. It gives the total consumption of reagent and the amts. used to neutralize the individual components. N. Newcombe

Efficiency of electric filters for purification of air from asbestos dust. L. A. Glushkov, P. M. Kogan, and G. A. Vasilevskaya. *Voprosy Gigieny Truda, Professional. Patol. i Toksikol. v Prom. Sverdlovsk. Oblasti* (Sverdlovsk) *Sbornik* 1958, 73–9; *Referat. Zhur., Khim.* 1957, Abstr. No. 7030.—Description is given of the conditions, procedure, and results of summer and winter testing of an exptl. elec. filter for the removal of asbestos dust from air. The elec. filter, is a dipolar plate filter with horizontal gas flow and rod-shaped pptn. electrodes. It was operated as second stage (after the dust-settling chambers), or third stage dust removal unit (after the settling chambers and a twine filter). With an initial dust concn., at the inlet to the elec. filter, of 0.8–2.4 g./cu. m. and air velocity, within the active zone, of 1.5 m./sec., the degree of air purification in the elec. filter was 94–98%; the residual dust content of the air, prior to discharge to the atm. was 20–100 mg./cu. m. J. J. G.

Theory of aerosol filtration. S. K. Friedlander (Johns Hopkins Univ., Baltimore, Md.). *Ind. Eng. Chem.* 50, 1161–4(1958).—Pressure drop and efficiency of removal are the principal criteria for measuring the performance of fibrous filters that are operated at low velocities to sep. particulate matter from gases. Pressure drop can be predicted, but no satisfactory general correlation for efficiency as a function of the several dimensionless groups describing the filtration process has been developed. This report reviews and extends the theory; a design correlation is derived and compared with exptl. literature data. B. I. Ferber

Automatic water changer and agitator for use in dialysis. Jack K. Mullen (Naval Supply Center, Oakland, Calif.). *Med. Technicians Bull.* 9, 150–2(1958).—This app. decreases the dialysis time to less than half, conserves distd. water, and minimizes the possibility of rupture of the membrane bag. J. A. Kennedy

Solid-liquid extraction. II. Practical equilibrium data. D. C. Freshwater (Loughborough Coll. Tech., Engl.). *Perfumery Essent. Oil Record* 49, 268–8(1958); cf. *C.A.* 52, 13374*h*.—Effect of temp., detn. of equil. data, liquid retained by the solid, and extn. at elevated temps. are discussed. H. M. Burlage

Polyethylene box-type mixer-settler extractor. Lester Knapp, Roman Schoenherr, John Barghusen, and Morton Smutz (Iowa State Coll., Ames). *U.S. Atomic Energy Comm.* (UC-4) 22 pp. (1958).—A new extractor of polyethylene embodies known principles (*C.A.* 50, 15143*b*) but features horizontal arrangement of stages, interface control in each stage, compactness, and freedom from corrosion. It is in the form of a rectangular box partitioned into stages. Each of these is divided into an antechamber *A* and a settling chamber. A mixing chamber *M* is suspended in each *A*, and carries a motor-driven impeller. An adjustable weir leading to the *M* permits adjustment of interface height during operation. The extractor was used for sepg. (1) Nb and Ta and (2) rare-earth nitrates. H. Pearsall

Packed-column performance of carbon dioxide-monoethanolamine system. Aaron J. Teller and Harry E. Ford (Fenn Coll., Cleveland, O.). *Ind. Eng. Chem.* 50, 1201–6 (1958).—The performance characteristics of three com. packings: 1-inch polyethylene Tellerettes, 1-inch ceramic Berl saddles, and 1-inch steel Raschig rings, were evaluated for operation in the CO_2-monoethanolamine system under conditions in the range of those in industrial installations. Liquid rates were varied from 1500 to 6000 lb./hr./sq. ft. for gas rates of 661 and 970 lb./hr./sq. ft. The min. transfer coeffs. occur at the bottom section of the tower where the concns. of CO_2 in the liquid and gas phases are at their max. within the limits of economic operation of 110°–120°F. and 2–4*M* monoethanolamine soln. This area of operation was investigated in a short tower by maintaining the gas feed in the range of 8–12% CO_2 and the feed liquor in the range of 0.14–0.18 mole of CO_2 per mole of monoethanolamine. The polyethylene Tellerettes achieved 23 to 72% more effectiveness than the Berl saddles or the Raschig rings in mass transfer rates as a function of flow conditions. William J. Lawson

Some remarks on the applicability of Chu-Kwang's equations in batch fractionation calculations of multicomponent mixtures. Teodor Vrbaški (Inst. Ind. Research, Zagreb, Yugoslavia). *Recueil Chem.* 32, 353–63(1958)(in English).—The course of batch fractional distn. of a mixt. contg. 24.0 mole % C_6H_6, 40.7% toluene, and 35.3% xylene in a column of 4 theoretical plates with reflux ratio equal to 9 was detd. and calcd. by the aid of Chu (*C.A.* 48, 1075*b*) and Robinson and Gilliland's method (cf. G., *Elements of Fractional Distillation*, 1950 (*C.A.* 45, 2273*b*)). The first of them leads to erroneous results. The method of R. and G. gives correct results with a max. deviation of 10%. A. K.

Vapor-liquid equilibrium stills. M. Ramanujam (Univ. Madras, India). *Allech* (Univ. Madras) 7, 53–69(1957–58). —Numerous types of app. for the study of vapor-liquid equil. are described. 52 references. J. D. Porter

Evaporation and condensation of hot water in slow circulation evaporators. George Lejeune and Jean Savornin. *Compt. rend.* 246, 2862–4(1958).—Expts. were made with 3 different models of evaporator-condensers with slow circulation at temps. which permit the use of solar heaters (70°). The efficiency is improved by preheating the feed and by cooling the condenser with cool water. The method may be practical for the distn. of brackish or saline waters. Friedel E. Hecht

Distillation process in molecular stills of the centrifugal type. V. A. Malynov, N. A. Malafeev, and N. M. Zhavoronkov. *Khim. Prom.* 1958, 31–8.—A lab. mol. centrifugal still with a conical rotor (diam., top, 228 mm.; bottom 167 mm.) and a total evaporating surface of 0.102 sq. m. was investigated. The speed of rotation was 1450 r.p.m. Sepn. under nonequil. conditions was studied with a mixt. of bis(2-ethylhexyl) phthalate and bis(2-ethylhexyl) sebacate (cf. Hickman and Trevoy, *C.A.* 47, 6707*a*). The observed distn. rate exceeded the rate calcd. by Langmuir's formula because of some spattering (entrainment) of the liquid during distn. The true sepn. rate was calcd. by the Burrows formula (*C.A.* 49, 671*h*) by using a 6-fold value for the mean free path derived from the kinetic theory. The sepn. efficiency under actual distn. conditions was somewhat reduced at increased liquid load, and a max. was found on the curve of theoretical plates vs. distn. temp. at about 0.75–0.78. In the absence of spattering, the efficiency was close to 1 (approx. 0.95) and was little affected by "spraying d." and temp. Raising the inert gas pressure lowered the distn. rate and the efficiency. The distn. rate was sufficiently accurately detd. by a modification of Carman's formula $G_n = G_m[1 - (P/P_t)]$ (*C.A.* 43, 2041*d*), where G_m was substituted by fG_m, calcd. from Burrows' equation. The true efficiency of the app. was independent of the inert-gas pressure, and the lower efficiency at a higher pressure was caused by more entrainment. The efficiency of the still was adequately expressed by $(1 - \beta) \times 0.95$, where 0.95 is the efficiency with no entrainment and β is the experimentally detd. proportion of entrainment in the distillate. W. M. Sternberg

Mixing studies on a perforated distillation plate. A. I. Johnson and J. Marangozis (Univ. Toronto). *Can. J. Chem. Engr.* 36, 161–8(1958).—In establishing a relation between the plate efficiency and the point efficiency for perforated plates, liquid splashing is considered a new mechanism for the mixing of the liquid phase in the direction of flow. Splashing measurements are correlated with flow rates, weir heights, kinematic viscosity of the liquid, and some aspects of tray geometry. Plate efficiencies for the desorption of NH_3 by air are reported for a 36 × 3-in. perforated plate. Concn. gradients across the plate were measured for NH_3 desorption and for backward distribution of NaCl by splashing. These concn. gradients are related to the splashing measurements. Maxey Brooke

Determination of the separating power of heavy-media

the carrier. A catalyst prepd. by depositing Ni on Al_2O_3 with broad pores has a high degree of activity and stability. That prepd. by deposition on fine-pored Al_2O_3 is much less active. J. Rovtar Leach

a The activating action of calcium in multicomponent catalysts. Alfons Krause and Ludwik Schulz (Univ. Poznań, Poland). *Roczniki Chem.* 32, 1191–3(1958)(German summary).—$Ca(OH)_2$ shows superadditive activity in the ternary catalyst composed of $Fe(OH)_3$, $Cu(OH)_2$, and $Ca(OH)_2$, when acting on the H_2O_2 decompn. at 37°. Pure $Ca(OH)_2$ is inactive. The activity of lime appears usually in complexes with Cu^{++}. The possible radical structure of such catalysts is discussed. —A. Krzęglewski

b Sulfonic acid ion-exchange resins based on polystyrene and formaldehyde. A. A. Vasil'ev and A. A. Vansheidt. *Zhur. Prikład. Khim.* 31, 1692–7(1958); cf. *C.A.* 53, 2734g. —Emulsions of polystyrene (mol. wt. about 100,000) were sulfonated with H_2SO_4 in the concn. range from 92% to oleum contg. 65% SO_3. In all cases not less than 6 parts of oleum/part polystyrene were required regardless of the initial concn. of the acid. When less than the optimum amt. of acid was used the resins obtained had the same ion-exchange capacity, *a*, but they were insol. in H_2SO_4, had a high swelling coeff., *k* (above 10), and low mech. strength. When more acid was used (9:1) *k* was high. At the optimum ratio of 6:1 sulfonated polystyrene was heated with oleum contg. 5–10% SO_3, with stirring, up to 205–15° till completely dissolved. The soln. was cooled, 1.0–1.1 moles CH_2O/link of polystyrene was added with stirring, heated gradually to 130–50°, cooled, pulverized, washed with H_2O, 2–3 days with *N* NaOH, regenerated with 2*N* HCl, and washed with H_2O till neutral to methyl orange. For this resin (SSF), *a* = 4.2–4.6 meq./g. and *k* = 2.4–3.2. SSF was highly selective toward Terramycin and Aureomycin. I. Bencowitz

c

d

Application of radioactive sulfur-35 for the determination of sulfo groups in sulfocarbon. N. P. Drozdov and A. N. Popov. *J. Appl. Chem. U.S.S.R.* 30, 1140–3(1957)(English translation).—See *C.A.* 51, 18391*f*. B. R. B.

Powdering of ion-exchange resins. V. P. Meleshko, O. V. Chervinskaya, M. N. Romanov, and D. P. Izmailova. *J. Appl. Chem. U.S.S.R.* 30, 854–7(1957)(English translation).—See *C.A.* 51, 15537*e*. B. R. B.

e

Secondary processes of amphoteric ionites and the possibility of their practical utilization. A. B. Davankov, V. M. Lanfer, and L. A. Shits. *J. Appl. Chem. U.S.S.R.* 30, 887–91(1957)(English translation).—See *C.A.* 51, 17022*f*. B. R. B.

Ion exchangers. V. G. Amsterweil. *Génie chim.* 80, 29–43, 62–78(1958).—This is a comprehensive discussion of basic information on the subject. The following types of exchangers and their uses are described: natural and synthetic minerals, synthetic org.-base exchangers of polycondensation, polymerization, and plastic origin. Other topics discussed are: exchange equil. in terms of electron pptn. reaction, Donnan equil., and mass action; exptl. methods and results for column exchange; ion-exchange membrane processes; applications of ion exchange. E. W. B.

f

Radiological evaluation of ion-exchange materials. W. Fuchs and F. Gebhardt (Tech. Hochschule, Aachen, Ger.). *Mitt. Ver. Grosskesselbesitzer* No. 55, 282–5(1958).—The max. vol. capacity (MVK) of an ion-exchange resin is detd. by its chem. analysis, and is a const. for a given resin. This value can only be reached by very low rates of flow and high initial concns. The useful vol. capacity (NVK) of a resin is not a const.; for given dimensions of an exchange filter NVK varies with the filter loading and the rate and concn. of the regenerating soln. Values of NVK for given conditions can be detd. by flowing naturally radioactive KCl solns., or solns. of $CoCl_2$ contg. Co^{60}, through the exchange filter. Continuous measurements of radioactivity may be made on the effluent directly, or on a series of samples of the effluent, so that the concn. in the effluent and time of break-through can be detd. Data are presented for Lewatit S 100, Lewatit KSN, and Amberlite IR 120 resins. Roger W. Ryan

g

Chemical stability towards radiation of ion-exchange resins. Action of γ- and β-irradiation on cationites. A. P. Polevodov, V. A. Nikashina, A. V. Gordievskiĭ, M. M. Senyavin, and A. Kh. Breger (D. I. Mendeleev Chem.-Technol. Inst., Moscow). *Nauch. Doklady Vysshei Shkoly, Khim. i Khim. Tekhnol.* 1958, 761–4.—Under the influence of γ-irradiation the capacity of the resins studied is somewhat lowered. The decrease is almost insignificant in the case of the cationites KU-1, KU-2, and RF (from 3 to 9%). The capacity of SBS is increased by 11% with 5×10^5 röntgens and is decreased by a further increase in the irradiation. KB-4 (a carboxylic resin of aliphatic structure) is the least stable to the action of γ-quanta. Its capacity is decreased by 17% for a 3×10^4-röntgen irradiation. The reason for the difference in the decrease in capacity of carboxylic, sulfo-, and phosphoric acid resins is apparently the different stability toward radiation of the groups COOH, H_3PO_4, and SO_3H. A variation in the swelling capacity of the resins indicates either a destruction or a "stitching" of the cationites. The swelling capacity varies sharply, especially at doses $<10^5$ röntgens. The swelling capacity of PhOH-HCHO cationites (RF, KU-1) increases with the dose, i.e. destruction of these resins occur; that of SBS (a sulfo-resin with cross-linked butadiene components) increases in the interval 5×10^5–5×10^6 röntgens, and that of KU-2 (sulfopolystyrene resin in which divinylbenzene is the bridge-forming agent) remains unchanged at the above mentioned doses, and sharply decreases (also SBS) with a γ-irradiation $>10^6$ röntgens. The max. value of oxidizability was observed for KB-4 (a 4-fold increase at 3×10^4 röntgens). This indicates the slight stability towards radiation of the aliphatic components of the resins. The most stable is KU-2. The capacity of all cationites studied decreases with an increase in the β-irradiation. The sulfocationite KU-1 showed the smallest decrease (~2.5%), while KB-4 decreased the most (45%). The cationites KU-1, SBS, and KB-4, irradiated by 5×10^5 röntgens showed an increase in their swelling capacity. The swelling capacity of RF decreases for doses up to 5×10^5 röntgens, and increases for greater doses; that of KU-2 decreases with an increase in the dosage. The data concerning the chem. stability of the resins is in complete agreement with the data concerning the swelling capacity. KU-2 is the most chemically stable. The action of γ-rays is observed to be more destructive than that of α-particles for the same integral dosage. Jean Piganiol

i

Reversibility of ion-exchange processes on cation-exchange resins. E. A. Bozhevol'nov. *Trudy Vsesoyuz. Nauch. Issledovatel. Inst. Khim. Reaktivov* 1956, No. 21, 105–7; *Referat. Zhur., Khim.* 1956, Abstr. No. 57704.—A series of expts. is described in which 2 samples of cation-exchange resin in Sr (from labeled Sr) and the other in H, K, Ba, Mg or Pb form, are brought to equil. with the identical vols. of electrolyte (0.05*M* HCl). Equal samples of the cation-exchange resin contain equal amts. of sorbed Sr. This indicates that in all investigated cases the ion-exchange sorption is reversible. V. S. Mihajlov

j

Fundamental aspects of the fight against corrosion in the chemical industry. R. Marpon. *Peintures, pigments, vernis* 34, 491–8(1958).—The corrosive atm. usually encountered in the chem. industry requires not only an appropriate carefully selected protective coating on materials subject to corrosion, but equally, frequent inspections and recoatings. Andries Voet

Industrial toxicology of some chlorinated hydrocarbons. M. Šarić and Jelica Knežević (Inst. Med. Research, Zagreb, Yugoslavia). *Arhiv. hig. rada* 8, 251–69(1957)(English summary).—Investigations of the action of CCl_4, hexachloroethane, and hexachlorocyclohexane on 81 workers in dry cleaning shops and a drug factory were examd. The most significant findings were alterations in the serum albumin:globulin ratio. T. Bíkan-Fikter

k

Toxic hazards: asbestos. George E. Morris. *New Engl. J. Med.* 260, 141(1959).—Max. allowable concn. of asbestos in industrial atms. is 5,000,000 particles/cu. ft. of air. Persons with previous pulmonary or cardiac disease should not be employed where exposure to asbestos dust is a problem. X-ray study of the chest and phys. examn. annually should be required of all persons employed in dusty asbestos operations. The signs and symptoms of asbestosis are described. Marion Horn Peskin

X

See also: Prepn. of cellulose derivs. with ion-exchange properties (Iritani) 23.

Patents: Plaster for mounting elec. app. (Drummond) 20. Polymeric sulfonamidoalkyl vinyl derivs. [ion-exchange resins] (Melamed) 31. Ceramics of low dielec. loss [insulators] (Compagnie générale de télégraphie sans F. I.) 10. Improved epoxide resin compns. (McDowall) 31.

San Marina, Calif.) and G. J. Doyle. *J. Air Pollution Control Assoc.* 8, 293–6(1959).—Automobile exhaust gas was filtered and irradiated with 1-hr. residence (with Hg-vapor lamps, *C.A.* 51, 9048b) and then sampled on a glass-wool filter. The app. used for these expts. was described by Schuck and Rogers (preceding abstr.). Microchem. analysis indicated that the material consists mostly of C, H, and O, with traces of other materials, chiefly N. The infra-red spectra definitely indicated the presence of OH and CO groups which are probably aldehydic. The transmission of H_2O extracts was also measured in the visible and ultra-violet regions. Results are not very useful for chem. identification but do indicate that blue and ultraviolet light are scattered more than longer wave lengths by aerosols of these materials. Samples of dil. auto exhaust, both irradiated and unirradiated, also were analyzed. Irradiated auto exhaust gas appears to be the principal source of nitrate, sulfate, Pb, and organic compds. according to these samples, and probably in the particulate matter of Los Angeles smog. These findings explain the higher values of nitrate and sulfate found in Los Angeles and similar West Coast cities in comparison with other cities. The 6,000,000 gal. of gasoline consumed per day in Los Angeles would yield about 1 ton per day of nonirradiated particulate; at least 10 tons per day of photochemically generated particulate are present in a typical smog.
Roger W. Ryan

Air pollution effects of incinerator firing practices and combustion air distribution. Andrew H. Rose, Jr., Robert L. Stenburg, Morton Corn, Ronald R. Hornsley, Daniel R. Allen, and Paul W. Kolp (R. A. Taft Sanit. Eng. Center, Cincinnati, O.). *J. Air Pollution Control Assoc.* 8, 297–309 (1959).—A small, refractory-lined multiple-chamber proto-type incinerator was used for these tests with a uniformly prepared rubbish of 25% moisture content, which was burned under closely controlled conditions of charging and air distribution. Correlation between discharges produced under these test conditions and the pollutants resulting from full-scale incinerators will be made later. Solid contaminants in the combustion products were least with 150% excess air. The concept of phys. entrainment of solids as the sole mechanism for producing total solid emissions is not valid. Other factors such as volatilization and condensation of inorg. compds. and incomplete combustion also affect the discharge. An infrared analyzer was used to detect hydrocarbons in terms of C_4H_{10}. This app. had a low sensitivity to unsatd. hydrocarbons, and cannot detect hydrocarbon concns. of less than 30 p.p.m. Occasional surges of hydrocarbons in flue gases with 50% excess air took place due to flash burning; at 150% excess air no hydrocarbons were detd. Occurrences of CO and hydrocarbons always coincided and were of approx. the same duration. The larger portion of the N oxides in the stack effluent was in the form of NO. The concn. of N oxides did not increase linearly with temp., but did increase as a logarithmic function. Increasing the excess combustion air resulted in increased formation of N oxides for a given grate loading, despite the accompanying reduction in temp. Increased grate loadings can be expected to result in increased emissions of N oxides. Random observations indicated smoke d. to be essentially zero, and the odor level was undetectable in the immediate vicinity of the stack.
Roger W. Ryan

Development of a specific method of analysis of copper in the air. N. P. Anashkina. *Voprosy Gigieny Truda Proferitsinal. Patol. i Toksikol. v. Prom. Sverdlovsk. Oblasti Sverdlovsk, Sbornik* 1955, 249–54; *Referat. Zhur., Khim.* 1956, Abstr. No. 78425.—The reaction previously described of 4-phenyl-1,2-dithiole-3-thione (Voronkov and Tsiper, *C.A.* 46, 2953h) was used for the detn. of Cu vapors in the presence of Pb, Zn, Sn, and other metals. Pass 500–1000 l./l. of air, contaminated with Cu vapors, at a rate of 10 l./min. through an adapter with glass wool, moistened with 3–5 ml. of 3% HNO_3. Wash the absorbed Cu from the wool with a 3% HNO_3 soln. and with H_2O if necessary, conc. the soln. by evapn., and place a drop of the liquid obtained on a dry test paper, impregnated with a satd. alc. soln. of 4-phenyl-1,2-dithiole-3-thione. After drying note the rose-colored spots in the presence of Cu; compare the intensity of these spots with a standard, analogously prepd. with the application of solns. with Cu concns. of 0.001, 0.0025, 0.005, 0.0075, and 0.01 mg./l. The colorimetric analysis is still possible at a Cu concn. of 1 γ/ml. Under analogous conditions Pb, Zn, Mn at concns. up to 0.1 mg./l. do not show a coloration with the reagent. An increase of the HNO_3 concn. up to 10% causes a grayish tone of the spot.
G. G. Dartau

Determination of atmospheric dust with an electrophotocolorimeter. E. V. Rykhter and N. V. Sblygina (District Sanit.-Epidemiol. Sta., Perm). *Gigiena i Sanit.* 23, No. 9, 18–22(1958).—Air is passed at 20 l./min. through 10 ml. 1:1 EtOH-glycerol mixt. in a Rykhter Model 7P universal liquid absorber for 3–4 min. The turbidity of the resultant suspension is stable for several days. It is compared to that of standards, which will vary with the type of dust.
John Howe Scott

Current state of atmospheric pollution by automobile exhaust gases and problems of its control. M. K. Nedogibchenko. *Gigiena i Sanit.* 23, No. 8, 6–9(1958).—Comment on the concn. of CO, Pb, 3,4-benzopyrene, and tars reported as present in the atm. at various distances from the streets of several Russian cities, and on the means available of reducing them.
John Howe Scott

Collection of gas-borne dust particles by means of an aspirated sampling nozzle. S. Badzioch (British Coal Utilization Research Assoc., Leatherhead, Engl.). *Brit. J. Appl. Phys.* 10, 26–32(1959).—The efficiency of collection of gas-borne particles by an aspirated sampling nozzle is investigated theoretically and experimentally. Theoretically, the efficiency is shown to depend on the ratio of the velocity of aspiration into the sampling nozzle to the velocity of the undisturbed gas stream, and the ratio of a length representing the distance of a disturbance upstream of the nozzle to the range of a particle (the range being the distance a particle would travel, before coming to rest, if projected into still gas with a velocity equal to that of the gas stream). With nozzles of 0.65 to 1.90 cm. diam., aspirating from turbulent gas streams, the length representing the upstream disturbance is a function of the diam. of the nozzle.
Seymour M. Kaye

Use of paper filters in ventilation units. V. V. Kucheruk and G. S. Matyukhin. *Vedomstvennie i Sanit. Tekh.* 8, 6–10(1955); *Referat. Zhur., Khim.* 1956, Abstr. No. 80443.—The Moscow institute of labor protection of the All-Union Central Council of Trade-Unions proposes the installation of paper filters of alignin (from lignin-freed cellulose) and of porous tissue paper. Alignin and tissue paper are fixed in several layers in special adapters. It is possible to put in one adapter up to 10 layers of alignin, whereby the total thickness of the layer has to be ~2 mm. The filtering surface of the charge is up to 1.9 sq. m.; the air charge of 1 adapter is 1000–1100 cu. m./hr. at a normal charge of 500–600 cu. m./hr. It was found that the high degree of air purification (95.7%) is the main advantage of the filter at an insignificant resistance (to 3.3 kg./sq. m.). The dust capacity of a 6-layer alignin filter goes up to 160 g. The service of a filter goes up to 1180 hrs. The paper filters are used with a high effect in motion-picture industry, in pharmaceutical, textile factories, etc.
G. G. Dartau

Amount of dust in the residential sections of the city. Asbest and its effect on the children's health. A. T. Bobyleva, R. M. Bukhantseva, S. E. Lovtsova, and M. S. Sadilova (Inst. Ind. Hyg. and Professional Pathol., Sverdlovsk). *Gigiena i Sanit.* 23, No. 11, 9–12(1958).—At 1–1.5 km. from the asbestos factories the av. dust content in the atm. was 11.4–18.9 mg./cu. m. Of this, 45.4–52.4% is below 1μ in diam., 32.4–9.3% is 1–5 μ. Comparison of the health of children ages 7–14 years living in a dusty part of town with that of those living in less dusty shows that they have a lesser lung vol. and an increased incidence of respiratory diseases. Hygienic evaluation of the atmosphere in the region of an abrasive plant. M. Karimov (Sanit.-Hyg. Med. Inst., Leningrad). *Ibid.* 72–3.—A similar study for an abrasive plant. Av. concns. of dust and SO_2 in mg./cu. m. from the plant were 0.26 and 0.32, resp.
J. H. S.

Purification of air and gases in utilization of atomic energy. L. Silvermen. *Dozimetriya Ionizirayushchikh Izlucheniy* (Moscow: Gosudarst. Izdatel. Tekh.-Teoret. Lit.) 1956, 435–58; *Referat. Zhur., Khim.* 1956, Abstr. No. 80444.—A review of methods of purification of air and gases evolved during mining, enriching, processing, and utilization of nuclear fuel (U and Th). Processes of formation of radioactive gases and aerosols are described and specifications for gas- and air-purification equipment, corresponding to various problems, are formulated. The term "purification coeff." (KO) is proposed for rating of the effectiveness of the equipment; this coeff. reflects the part of aerosol passed and not trapped by the app. KO-10 means a catching of 90%, KO-

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Med. J. Australia 1959-II, 105–13.—A lecture on pernicious anemia, Co, and vitamin B_{12}. Erich Hirsch berg

Isoniazid and the organism. Experimental physiopathological research. Gennaro Di Macco (Univ. Rome). *Sci. Med. Ital.* (Eng. ed.) 7, 243–53(1958).—Studies on the capacity of isoniazid to change the reactivity of the organism to pathological stimuli indicate that, on the whole, the n. e. vegetative orientation tends to be predominantly cholinergic. Erich Hirschberg

Alterations in liver nucleic acids in rats during carcinogenesis with 4-dimethylaminoazobenzene. A. Khadzhilov (Med. Fac., Sofia, Bulgaria). *Z. Krebsforsch.* 62, 361–9 (1958).—Histochem. and biochem. detns. indicate that during the first 45–50 days of carcinogenesis hepatic ribonucleic acid (RNA) decreases while deoxyribonucleic acid (DNA) increases. RNA disappears from dying hepatic cells and is low in rapidly growing cholangioepithelial cells. At a later period (95–100 days), the content of RNA begins to increase, together with the amt. of DNA. Hepatomas and cholangiomas are characterized by a high level of RNA and DNA. Erich Hirschberg

Glycogen content in carcinomas of the oral cavity. Erhard Fasske and Konrad Morgenroth (Städt. Krankenanstalten, Essen, Ger.). *Z. Krebsforsch.* 62, 375–82(1958).—Histochem. measurements indicate that a larger percent of oral malignant carcinomas than of carcinomas of the portio uteri contain glycogen. Detns. in normal oral mucosa are also presented. Glycogen content does not depend on the level of circulating insulin. Erich Hirschberg

Anticancer experiments. H. Okamoto, S. Koshimura, R. Hirata, K. Murasawa, Y. Bando, and R. Shimizu (Univ. Kanzawa). *Z. Krebsforsch.* 62, 408–18(1958)(in English).—Living hemolytic streptococci inhibit the growth of the Ehrlich ascites carcinoma and the Yoshida ascites sarcoma, presumably by forming streptolysin S at the expense of tumor ribonucleic acid. Other microorganisms (e.g. *Streptococcus faecalis, Staphylococcus aureus, Diplococcus pneumoniae, Escherichia coli, Neisseria gonorrhoeae*) do not have these effects. The Yoshida tumor is inhibited by nitromin and by 6-(2-hydroxy-3,5-dibromophenylazo)-4-hexylresorcinol (I), but not by 6 hydroxybenzylidenes, 5 phenoxazones, 11 quinones, and 24 miscellaneous compds. tested in these expts. Inhibition of the Ehrlich tumor by I was more striking than that by mitomycin, carzinophilin, actinomycin J, 6-mercaptopurine, triethylenethiophosphoramide, or 1,6-bis(2-chloroethylamino)-1,6-deoxy-D-mannitol. I also inhibited the ascitic form of sarcoma 180. E. Hirschberg

Energy reactions inducing anoxygenic synthesis demonstrable in human tumors. F. Windisch (Deut. Akad. Wiss., Berlin), W. Nordheim, and W. Heumann. *Z. Krebsforsch.* 62, 423–33(1958).—Decoctions of various human cancer tissues may cause a marked generative effect on anabiotic fermenting yeast cells, but have no influence on the growth of respiring cells. Erich Hirschberg

Chemically defined substances, identical in action with materials present in cancer, endowed with an anoxygenically energy-liberating potential. F. Windisch, U. Gerhardt, W. Nordheim, W. Heumann, and H. Kerner (Deut. Akad. Wiss., Berlin). *Z. Krebsforsch.* 62, 568–84(1958).—A microbiol. test with *Saccharomyces carlsbergensis* strain U (preceding abstr.) is used to det. the ability of various materials to cause cell multiplication under strictly anaerobic conditions. The test is pos. with a series of plant and animal oils and lipide-contg. materials, e.g. sunflower oil, butter, and egg yolk (but not with liquid paraffin); with crude and purified lecithin (but not with lysolecithin); with crude cephalin and some of its fractions; with oleic, linoleic, linolenic, arachidonic, and clupanodonic acids (but not with petroselinic or erucaic acids). DL-6,8-Dimercaptooctanoic acid is inactive at noncytostatic concns. Diphosphopyridine nucleotide is inactive under these anaerobic conditions but active with aerobiosis. 63 references. Erich Hirschberg

A new procedure for cancer diagnosis. The agar-binding reaction. G. Csaba and I. Toro (Med. Univ., Budapest, Hung.). *Z. Krebsforsch.* 62, 481–94(1958).—A pos. reaction consists in the appearance of turbidity when the serum of cancer patients is added to agar under defined conditions. The reaction was pos. in 86% of 375 histologically proven carcinomas, in 13% of 528 patients with a wide variety of other diseases, and in 7% of normal subjects. In expts. dealing with the theoretical basis of this reaction, heparin, galactose, glucose, and fructose inhibited the formation of turbidity with cancer serums. It is postulated that rapidly growing tumor cells attack the hyaluronic acid-heparin barrier built up against them in the organism, liberating mucopolysaccharides demonstrable in the circulation by the agar-binding reaction. Erich Hirschberg

Influence of dehydroascorbic acid on tumor metabolism. E. Heise, W. Löhrs, and O. Neunhoeffer (Deut. Akad. Wiss., Berlin). *Z. Krebsforsch.* 62, 509–15(1958).—Dehydroascorbic acid (I) reduces anaerobic glycolysis, proportionately to its concn., by 34–68%; aerobic glycolysis is reduced 24% and respiration increases by 42%. I is not toxic up to 500 mg./kg. administered to rats. At 2 mg./kg., intravenous injections of I retarded the growth of Jensen sarcoma and Walker carcinosarcoma 256 in rats and of the *Ehrlich ascites tumor in mice. Higher doses of I* were not more effective. Erich Hirschberg

Influence of zymosan on experimental animal tumor growth. W. Löhrs, E. Heise, and H. Berndt (Deut. Akad. Wiss., Berlin). *Z. Krebsforsch.* 62, 516–18(1958).—The intravenous injection of 20 mg./kg. zymosan into rats bearing the Jensen sarcoma or the Walker carcinosarcoma 256 retards tumor growth, presumably by influencing the level of properdin. Erich Hirschberg

Uptake of methionine-S^{35} by the mitochondria of neoplastic cells. G. Giudice and V. Mutolo (Cancer Research Center, Palermo, Italy). *Z. Krebsforsch.* 62, 548–51(1958) (in English).—DL-Methionine-S^{35} was injected into normal mice and mice bearing the Ehrlich ascites tumor. Normal liver cells and ascites tumor cells were fractionated, and the sp. activities of the fractions were studied. Tumor mitochondria took up the labeled methionine at a lower rate than those of normal liver cells. After 3 hrs., the trichloroacetic acid-sol. fraction was more active in the tumor cells than in the normal cells. These differences were not found when the labeled methionine was administered *in vitro* to cultures of normal or malignant cells. Erich Hirschberg

Influence of adrenochrome on tumor cell metabolism. E. Heise, W. Löhrs, and O. Neunhoeffer (Deut. Akad. Wiss., Berlin). *Z. Krebsforsch.* 62, 555–60(1958).—Adrenochrome increases the respiration of cells of Jensen sarcoma or Walker carcinosarcoma 256 to double the normal amt. but does not influence aerobic and anaerobic glycolysis when added at a level of 0.3 ml. of a 0.01*M* soln. Adrenochrome has no effect on the growth of Jensen sarcoma in rats. Adrenaline probably can be oxidized to adrenochrome by means of dehydroascorbic acid. Erich Hirschberg

Carcinogenic effect of asbestos implanted into rats. Dietrich Schmähl (Univ. Bonn, Ger.). *Z. Krebsforsch.* 62, 561–7(1958).—Asbestos fibers and small fragments were applied subcutaneously and intraperitoneally in 39 rats. Of the 30 rats which survived 15 months, 11 developed sarcomas at the site of implantation. Erich Hirschberg

Reactions of lymphoid tissue to stimulation by antigen. Albert H. Coons (Harvard Med. School, Boston, Mass.). *Harvey Lectures* 53, 113–29(1959); cf. *C.A.* 49, 15011*h*, 15012*a*.—A review. Julia O. Holmes

Significance of serum Fe determination in diagnosis of hepatobiliary diseases. Chin-Yüan Kuo, K'uo-Huan Liang, Sün-Yi Wang, and Hsiang-Sheng Huang. *Chung Hua Nei K'o Tsa Chih* 6, 340–5(1958).—Serum Fe was detd. by the α,α'-dipyridyl method of Bothwell and Mallet (*C.A.* 49, 9720*e*), with slight modification. The color developed was read against a series of Fe standards in a Klett photoelectric colorimeter. Among 20 normal subjects the av. serum Fe value was 118 γ %, 135.5 γ % for 10 males and 100.5 γ % for 10 females. In 27 cases of acute hepatitis the av. serum Fe value was clearly above normal: 225.1 γ %. There was no definite correlation between serum Fe and bilirubin in the different disease stages of hepatitis examd. In 5 cases of chronical hepatitis the av. serum Fe value increased to 218.4 γ %. In cirrhosis of the liver, the serum content of Fe was normal: the av. for 32 cases was 115 γ %. In obstructive jaundice serum Fe value was either equal to or below normal. The av. of 11 cases with gall stone was was 96.9 γ %, significantly different from that of acute hepatitis. In neoplastic liver diseases the serum Fe value was lower than normal while in cases of hepatic necrosis, inflammations of the gall bladder and bile duct the serum Fe values were within the normal range. Microcytic anemia, acute infectious hepatitis, and malignant liver tumor showed lower than normal serum Fe. These clinical studies showed that detn. of serum Fe was an effective method in testing

chloride groups of the resin were less active with the NH_2 and OH groups of wool than expected, grafting was completed by curing at 130–50° for 6–24 hrs. Thus, 8% or more resin content afforded satisfactory resistance to laundering and shrinkage, but resistance to dry-cleaning was poor. Grafting with cross-linking agents was necessary to overcome this deficiency and to decrease the quantity of resin required for satisfactory results. Thomas A. Wilson

Introduction of vinyl groups into wool fiber. L. A. Miller and R. E. Whitfield (Western Regional Research Lab., Albany, Calif.). *Textile Research J.* 31, 451–5(1961).—Vinylated wool as an intermediate in graft copolymer formation was prepd. by reactions with acryloyl chloride, maleic anhydride, Et acrylate, *N*-carbamoylmaleimide, glycidyl methacrylate, and *N*-*N'*-methylenebisacrylamide. Without swelling solvents, reaction occurred on the surface of the fibers; with such solvents, reaction occurred throughout the fibers, the extent and location of the vinyl groups being controlled by the concn. of resin, the time, and the temp. employed. Acryloyl chloride and *N*-carbamoylmaleimide produced a slightly yellow and a slightly pink color, resp. Thomas A. Wilson

The supercontraction of sound and weathered keratin fibers. O. A. Swanepoel (Rhodes Univ., Grahamstown, S. Africa). *Textile Research J.* 31, 616–24(1961).—Supercontraction studies on wool and mohair fibers at 85° showed the attainment of equil. in about 90 min. and 2 stages of contraction which were well defined with unweathered roots, but less pronounced and smaller for tip sections. The same result from slight weathering of the wool tips showed that the modifications in the wool structure responsible for the effect occurred very early in weathering, a conclusion substantiated by human hair roots exposed for 2 months to the atm. Weathering was accompanied by some conversion of disulfide cross-linkages into thioethers and the likely formation of intermediate oxidn. products of cystine without breakage of the linkages, some of which were actually stabilized by weathering, so reducing the contraction. The 2nd stage of supercontraction resulted from exposure of sterically protected H bonds and disulfide exchange in cross-linked zones of the microfibrils. Thomas A. Wilson

An effect of ionizing radiations on the hydrogen bonds in wool. Eugene Allen and Peter Alexander (Roy. Cancer Hosp., London). *Radiation Research* 15, 390–9(1961).—The root ends of Lincoln wool fibers were irradiated with 15 m.e.v. electrons, and their supercontraction was measured in a soln. of 100 g. LiBr in 100 g. H_2O and in a 5% (wt./vol.) $NaHSO_3$ soln. Before irradiation, contraction was 11.9% in LiBr. After 5×10^5 rads, it was 19.1% and no longer reversible. Larger radiation doses to 2×10^6 rads had little further effect. Contraction in $NaHSO_3$ increased progressively to 40% after a dose of 2×10^6 rads. The moisture content and O had little influence on the results. The relevant changes reside principally in the H bonding of the micelles, not in changes in the covalent bonds. L. S. Myers, Jr.

Methods of stabilization in the wet finishing of wool goods. Helmut M. Haffner. *Melliand Textilber.* 42, 1283–5(1961).—Mech. devices for attaining the wet stabilization of wool fabrics and the chem. changes desired in their constitution, are discussed. Factors influencing the result are H_2O temp. and pH, the duration of the treatment, and the kind of after-treatment employed. Five varieties of after-treatment possible with the Brennbook app. are mentioned. Thomas A. Wilson

Sweet-potato starch as a raw material for nylon 66. Lu-Goon Soong (Second Local Ind. Bur., Peking, China). *Hua Hsueh Kung Yeh* 1958, No. 6, 41–5.—A review with 14 references. Gyt Liu

Asbestos. The mineral fiber. J. Cooper. *Fibres and Plastics* 22, 289–92, 304(1961).—A discussion of the origin, properties, and compn. of various types of asbestos fiber and their processing into textile products. Fred H. Steiger

Biochemistry and bioenergy of water-air flax retting. S. I. Derbenev. *Nauch.-Issledovatel. Trudy Tsentral. Nauch.-Issledovatel. Inst. Prom. Lubyan. Volokon* 14, 3–34(1960).—Flax retting fluid could be reused 70 times or more with a consequent increase in the org. and inorg. residues, which impaired the quality of the freed flax fibers. An increase occurred in the proliferation of lactic acid bacteria which added to the impairment of the flax fibers, a condition which could be obviated by pasteurization. As the retting process continued, the concn. of ammonia N became reduced, which unfavorably affected the useful microflora; this condition was corrected by the addn. of $(NH_4)_2CO_3$ and NH_4HCO_3. H_2S decreased in the retting fluid with increased aeration and vice versa. Concns. of butyric, acetic, propionic, and formic acids decreased with increased aeration. Aerobic microflora lost more heat energy than anaerobic microflora. Heat energy eliminated in the process of the usual H_2O-air flax retting amounted approx. to 70,000 cal./ton of flax straw. From *Referat. Zhur. Khim., Biol. Khim.* 1961, Abstr. No. 19S1141. B. S. Levine

Origin of twisting orientation in fibrillar crystals. H. D. Keith and F. J. Padden, Jr. (Am. Viscose Corp., Marcus Hook, Pa.). *J. Polymer Sci.* 51, S4–S7(1961).—The twisting orientation in fibrillar crystals is caused by the impurity concn. build-up at the crystal face retarding crystn. This leads to dilatation of the lattice which is greatest where the impurity concn. is greatest, leading to the generation of stresses which can be reduced by the presence of substructure. In fine fibers or fibrils, the strain can be readily minimized by torsional twisting. C. A. Burkhard

Are plastics resistant to lipolytic enzymes? M. Hornauer. *Plaste u. Kautschuk* 8, 408–12(1961).—The resistance to enzymes (pancreas and stomach lipases and liver esterase) of cop material and worsted from Lanon (I) (polyester of ethylene glycol with terephthalic acid), Wolcrylon (II) and Prelana (III) (polyesters of HCN with allyl alc.), Dederon (IV), and PeCe [chlorinated poly(vinyl chloride)] (V) is examd. I shows the highest resistance. This is proved also by implantations which show that after 7 months in living muscle cells a loss of tensile strength of 10% arises. IV and V are resistant to lipolytic enzymes, whereas a certain attack of II and III is observed. The behavior of II and III to liver esterase and stomach lipase is of different kind. Active pancreas lipase has the greatest efficiency in relation to the mentioned plastics. R. Degenkolbe

Relationship between iodine sorption and crystallinity in cellulosic fibers. XVI. Thirty years of structural studies on cellulosic fibers through iodine sorption: a retrospect and thoughts about the future. Karl Schwertassek (Wirkereiforschungsinst., Brno, Czech.). *Faserforsch. u. Textiltech.* 12, 369–75(1961); cf. *CA* 54, 15940f.—A review with 24 references. G. J. Ernyei

Some aspects of the reaction between urea and cellulose. Leon Segal and F. V. Eggerton (Southern Regional Research Lab., New Orleans, La.). *Textile Research J.* 31, 460–70(1961).—When cellulose or viscose rayon and an aq., 50% soln. of urea or a 12% soln. of biuret in $HCONMe_2$ were heated at 140–70° for 30 min. to 2 hrs. and washed with boiling, distd. H_2O, the cellulose became insol. in cuprietylenediamine, its dyeing properties, moisture regain, and infrared absorption spectrum were changed, and it acquired a N content unaffected by boiling H_2O, but the x-ray diffraction pattern was not altered. The N content was 2% and 3% for cellulose and viscose, resp., without $CuCl_2$ as catalyst; with the catalyst, the N content became 2–3% and 5%, resp. Cellulose was regenerated by boiling the product in 2% NaOH for 30 min. A chem. compd. is apparently formed between the amorphous cellulose and urea, which might be cellulose carbamate. Thomas A. Wilson

Determination of acetyl content of secondary cellulose acetate. C. D. Bockman, Jr. (Tennessee Eastman Co., Kingsport). *Appl. Spectroscopy* 15, 84(1961). CA

Spinning mechanism of viscose. IV. Influence of coagulation reagents on the internal structure of cellulose xanthate gel. Naoji Komatsu and Rinzo Ono (Nippon Rayon Co. Ltd., Kyoto). *Sen-i Gakkaishi* 17, 896–902 (1961); cf. *CA* 54, 12896c.—Microscopic properties of cellulose xanthate filaments were measured to obtain some information about the mechanism of fiber formation from viscoses which were spun into various kinds of salt soln. It was observed that the network structure could be greatly influenced by the valence of the cation contained in the coagulation reagent. Junction points in cellulose xanthate filaments coagulated by bivalent cations were stronger and more stable than those coagulated by univalent cations, and the phenomena, such as growth and reforming of junction points which occur as a result of stretching, were more noteworthy when bivalent cations were used for coagulation. It was also considered that these properties were more pronounced for Cd^{++} and Zn^{++} ions than Mg^{++} ion, when compared at the same swelling value. These properties may be affected by various characteristics of the ions, but they should be related somewhat to coagulation power, according

ured at 30°, 45°, and 60°. Desorption is faster than 1st sorption, and the 2nd sorption proceeds initially at same rate as desorption. On 1st sorption only, there is ort induction period, and supersorption occurs. The e of change of fiber length on sorption and desorption a s been correlated with the sorption and desorption rates mselves. The long induction period on 1st sorption is to an irreversible relaxation of the fibers. Diffusion ffs. increase exponentially with the concn. and have ac- ation energies of 13 and 10 kcal./mole on 1st sorption and sorption, resp.
Fred H. Steiger

Separations of methylated sugars by gas-liquid partition romatography. Elias Klein and Charles J. Barter, Jr. Courtaulds Inc., Mobile, Ala.). *Textile Research J.* 31, 56–7(1961).—To study the ability of polyester stationary b uases to sep. Me glucosides of methylated sugars, 6 char- eterized Me glucosides and 3 mixts. were subjected to gas- quid partition chromatography by using a butanediol suc- inate and 2 different diethylene glycol succinate columns at 150°, 170°, and 220°, 15 lb./sq. in. inlet pressure, 100 cc./min. He flow, and 200 ma. filament current. The 3 mixts. consisted of a mixt. of Me α-D-glucopyranosides of varying Me substitution formed by methylating with a re- duced quantity of MeI; a mixt. of substituted Me gluco- pyranosides and furanosides formed by hydrolyzing a methylated rayon in 1.6N HCl in MeOH; and a mixt. of α and β anomers of partially methylated Me glucosides from the methylation of α-D-glucose with a reduced quantity of Me$_2$SO$_4$ and NaOH. The trimethyl glucosides were sepd. satisfactorily at the lower temps., but at higher temps. the relative retention times tended to aggregate rapidly.
Thomas A. Wilson

Effects of γ-ray irradiation on filaments of isotactic poly- propylene. Ichiro Sakurada and Fujiko Kimura (Univ. Kyoto). *Bull. Inst. Chem. Research, Kyoto Univ.* 39, 226–35(1961).—Filaments of isotactic polypropylene made from Moplen AS were irradiated *in vacuo* or in air at room temp. by using 200 e. Co^{60} up to a dose of 9.3 × 10^7 r. *in vacuo* or 3.1 × 10^7 r. in air with a dose rate of 7 × 10^4 r./hr. The ds. of the samples were almost unchanged by the irra- diation *in vacuo* while they increased considerably in air. The flow temp., the degree of shrinkage at the flow temp., the tensile strength, and the elongation at break decreased with the increase in dose. The Young's modulus and the elastic recovery were unchanged by the irradiation. The ef- fects of the irradiation on these properties depended on the presence of O.
Yutaka Miyahara

Thermochemical criteria of plasticized drawing. E. Z. Fainberg and N. V. Mikhailov. *Vysokomolekulyarnye Soedineniya* 3, 1234–7(1961).—The undrawn fiber of Lavsan (poly(ethylene terephthalate)) (I) was investigated. Its in- teraction with various reagents resulting in a heat effect was selected as a thermochem. criterion for plasticized drawing. The expti. results showed that the cold-drawing of I can only be effected with those plasticizers whose heat of interaction with the fiber is distinctly different from 0. The max. stretching of the fiber is possible at those concns. for which the heat of interaction is close to 0. From the practical point of view, the most acceptable plasticizer for drawing of I at room temp. was a 15–20% aq. soln. of HCONMe$_2$.
R. V. Mikhailovich

Effect of elongation and temperature on the recovery and apparent glass transition behavior of an experimental modacrylic fiber. George M. Bryant (Union Carbide Chemicals Co., South Charleston, W.Va.). *Textile Research J.* 31, 399–409(1961).—Measurements of stress, relaxa- tion, and recovery during up to 10% elongation of fiber contg. generally 70% acrylonitrile, up to 180°, suggest that the glass transition temp. is lowered as stretching is increased. At 1% elongation, min. tensile recovery occurred near 90°; at 10% elongation, the min. recovery region was broad, ex- tending through room temp. Just above the glass transi- tion temp. of the unstrained fiber, the recovery became in- dependent of elongation; at higher temps., it became temp.- dependent again. The 60 sec. stress-relaxation curves showed a max. at the glass transition temp. From assumed values of Poisson's ratio, it is estd. that an elongation of 5% may increase the speed of mol. response by a factor of 10^4.
Thomas A. Wilson

Crystallinity and iodine absorption of poly(vinyl alcohol) [fibers]. Saburo Okajima, Tetsuya Kikuchi, and Minoru Yamatomi (Tokyo Metropolitan Univ.). *Kogyo Kagaku Zasshi* 61, 1331–4(1958).—The sorption of iodine by poly- (vinyl alc.) (I) in a soln. contg. iodine, KI, and Na$_2$SO$_4$ was measured at 30°. With reference to satn. sorption of amorphous I, the accessibility of I treated in various ways was compared. Mech. treatment generally increases ac- cessibility. The accessibility at high iodine concn. is of the same order of magnitude as the accessibility of the D$_2$O ex- change reaction and that at low iodine concn. is closely re- lated to the d. of I. The change of accessibility is appreci- able when I is treated above 210°, this being attributed to fusion of the fibers. The change of ultraviolet absorption spectra below and above 210° also suggests partial fusion.
Hideaki Chihara

Polymers for man-made fibers. Anon. *Fibres and Plastics* 22, 320–9(1961).—A review of raw materials, spin- ning processes, fiber properties, trade names, and produc- tion data.
Fred H. Steiger

Mineral fiber of the textile industry—asbestos. P. Klimt. *Textil* 16, 331–2(1961). The theories of the origin of as- bestos, its mining, treatment of the raw material, classifica- tion of various sorts, characteristics of the main sorts, and the technology of its prepn. are presented.
I. Hypr

Hygroscopicity of acetylated jute. S. C. Roy (Indian Jute Mills Assoc. Research Inst., Calcutta). *Textile Research J.* 31, 573–5(1961).—Under certain conditions of acetylation, cellulose shows increased hygroscopicity. The acetylation of jute affects the intensity and spacings of A$_x$ and A$_y$ reflections in a manner suggesting that the change might be due to the absorption of moisture. A comparison of moisture regains of acetylated jute and cor- ton in glacial AcOH medium *vs.* their acetyl contents, and of moisture regains of jute acetylated in glacial AcOH and in xylene, showed, however, that the hygroscopicity of the substituted jute was never higher than that of the un- substituted jute so that the intensity and spacing changes were not due to moisture absorption, but were probably due to the introduction of acetyl groups.
Thomas A. Wilson

Spinning and stretching of polycondensate filaments. III. Structural changes in polyester filaments caused by heat and swelling agents. Werner Roth and Rudi Schroth (VEB Thueringisches Kunstfaserwerk "Wilhelm Pieck," Rudolstadt, Ger.). *Faserforsch. u. Textiltech.* 12, 361–9 (1961); cf. *CA* 54, 25643g.—Polyester filaments, pre- oriented in varying degrees, were studied by d., shrinkage, and stress-strain measurements. Owing to crystn., all un- stretched filaments showed a sharp increase in d. at ≥85°, regardless of the extent of preorientation. The d. of stretched filaments depended on the conditions prevailing during stretching, esp. the temp. All filaments tested ap- proached a d. of 1.42 g./cc. at 250°. Shrinkage in un- stretched filaments was evident in the temp. range between the l.p. and crystn. temp. Swelling agents, such as tetra- chloroethane, CCl$_4$, PhNO$_2$, HCONMe$_2$, EtCl, and HCHO, decreased the extent of shrinkage in unstretched filaments and increased it in stretched ones. By combining the ef- fects of swelling agents and heat, a max. d. of 1.435 g./cc. was achieved, corresponding to a crystallinity of 0.85. In- creasing temps. generally decreased the breaking strengths of the filaments, while swelling agents of high effectiveness also affected the stress-strain curve. Stretched polyester filaments showed, after swelling without stretching, a high increase in stretchability. By swelling under tension, this phenomenon, attributed to shrinkage, was significantly reduced.
G. J. Ernyei

Optical means of brightening. Peter Wuerthle. *Chem. Tech.* (Berlin) 13, 598–603(1961).—This review discusses the applications, mode of operation, and historical de- velopment of manufg. fluorescent org. compds. for the optical brightening of textiles, paper, and plastics during manufg., bleaching, printing, dyeing, and laundering. 20 references.
Glen F. Bailey

Dyeing and finishing of mixtures of polyester fibers with wool. Y. Guyonnet. *Chemiefasern* 11, No. 10, 660–7 (1961).—A survey of the dyeing and finishing procedures employed with polyester–wool mixts. in France included the topics: The sep. dyeing of flock, tops, or yarn; dyeing of mixed yarns; dyeing of piece goods (prepn., sizing, pre- shrinking, impregnation, and heat treatment); setting with steam, H$_2$O under pressure, or dry heat; dyeing in the vat or autoclave; finishing the mixed fabric; and finishing to achieve max. softness and flannel-like characteristics.
Thomas A. Wilson

Properties of Procinyl reactive dyes. S. Blackburn (Imp. Chem. Inds., Ltd., Manchester, Engl.). *Pakistan*

and at the same time max. intake of animal fat. A study of the DDT and DDE content of the diet and body fat of native Alaskans showed no DDT or DDE in any of the local foods. Eskimos store considerably less DDT and DDE in their body fat than does the general population in the U.S. a These low dietary levels and the resultant low levels in body fat are consistent with previously published (*loc. cit.*) data on the relation between intake and storage of DDT.
Felix Saunders

Influence of silicon on phosphorus metabolism. V. A. Shcherbatskaya. *Sbornik Rabot po Silikozu, Akad. Nauk S.S.S.R., Ural. Filial* 1960, No. 2, 197–201.—Influence of Si compds. on P metabolism in tissues was studied with the aid of P^{32}. Expti. rabbits were given on 6 successive days b 6 intravenous injections of a prepn. contg. 6% Na_2SiO_3 (neutralized to 75% by HCl) and glycerol, in doses of 25 mg. Na_2SiO_3/kg. wt. After the last injection, expti. animals received one subcutaneous dose of $Na_2HP^{32}O_4$ soln. (3000 impulses/min./kg. body wt.). Most P^{32} accumulated — in lungs, liver, heart, and spleen tissues. Radioactivity was usually less in bones and skin.
S. Janderka

Influence of silicon compounds on the state of cholesterol-protein complexes in animal organisms. N. A. Razumovskaya. *Sbornik Rabot po Silikozu, Akad. Nauk S.S.S.R., Ural. Filial* 1960, No. 2, 203–12.—Changes of cholesterol-c protein complexes in blood, plasma, liver, lungs, and muscles after introduction of Si compds. in exptl. animals were studied in 2 series of expts. on 30 rabbits and 25 albino rats. — Si compds. were administered as a prepn. contg. 6% Na_2SiO_3 and glycerol in one series and as 100 mg. intratracheal doses of quartz dust in 0.6 ml. of physiological soln. in the other series. Simultaneously with a decrease of cholesterol in d blood, liver, lungs, and muscles the amt. of easily extractable cholesterol increased and that of difficultly extractable decreased, either as a result of decompn. of existing cholesterol-protein complexes, or of their insufficient synthesis. — More pronounced changes were observed after the Na_2SiO_3 prepn. than after intratracheal administration.
S. Janderka

Influence of silicic acid and sodium silicate on the change of adsorptive capacity of erythrocytes for amino acids. F. D. Drobiz, *Sbornik Rabot po Silikozu, Akad. Nauk* e *S.S.S.R., Ural. Filial* 1960, No. 2, 213–16.—The action of Na_2SiO_3 or colloidal silicic acid prepd. by 2 different methods, in doses of 1 mg. for 1 ml. of blood, led to an increased adsorptive capacity of red blood cells for amino acids caused — by changes in the adsorption and penetration of amino acids into blood cells. This is considered an evidence of toxic action of silicic acid and Na_2SiO_3. Since glycine, alanine, and arginine are adsorbed very weakly on quartz dust, the f adsorption of the amino acids by erythrocytes was probably possible by a change at the surface of the cells.
S. Janderka

Influence of silicic acid on binding of radioactive metabolites to tissue proteins. T. I. Karantseva. *Sbornik* — *Rabot po Silikozu, Akad. Nauk S.S.S.R., Ural. Filial* 1960, No. 2, 225–31.—Silicic acid or urea administration caused an increased binding of radiomethionine by proteins of liver and kidneys, possibly as a result of denaturation changes in the structure and properties of the proteins. Inclusion of g radiomethionine into tissue protein was accompanied by uptake of radiophosphorus. Increase of binding of radiomethionine after introduction of silicic acid was, on the other hand, characterized by a decreased incorporation of radio- — phosphorus into proteins. Isolated serum proteins could also bind radiomethionine, a property which decreased noticeably after addn. of nonradioactive methionine or pancreatin.
S. Janderka

Tin and arsenic in eggs and milk after administration of h arsenate of tin as an anthelmintic. P. Castel, G. Gras, and M. Graber. *Trav. Soc. Pharm. Montpellier* 20, 246–4 (1960).—$SnHAsO_4 \cdot {}^1/_2H_2O$ was used as an anthelmintic in poultry (100 mg./kg.) and sheep (250 or 350 mg.) Sn did — not appear in eggs or milk. As was found in min. quantities in the products for 2 days following treatment.
R. P. Spencer

Incidence of lead in livers of Illinois raccoons. Glen C. Sanderson and Richard M. Thomas (Illinois State Nat. i History Survey, Urbana). *J. Wildlife Management* 25, 160–8(1961).—Concn. of Pb ranging from 1 to 32 γ were found in livers of 100 wild raccoons killed in Illinois by hunters and trappers during November and December 1958 and January 1959. *Only* one liver was neg. for Pb. Livers collected from raccoons during July–September had significantly less Pb than did those collected during October–December. Adrenal wts. of raccoons with lower levels of Pb were significantly heavier than those from raccoons with higher levels of lead. In the absence of other obvious causes of stress, levels of lead up to 32 γ/g. of liver caused no obvious symptoms of lead intoxication in the raccoon, which appears to be resistant to high levels. However, Pb intoxication, along with other factors, may be a cause of mortality in wild raccoons.
Martin Heerdt

Toxicity problems with solid missile propellants. Charles W. Kraul and Robert H. Duguid (Army Chem. Center, Md.). *Arch. Environmental Health* 3, 580–3(1961).—The evaluation of hazards in handling of missile propellants and other components such as nitroglycerine, epoxy compds. and polyurethans, NH_4ClO_4, org. isocyanates, and compds. of B and Be.
Raymond Zehnpfennig

Pathology of the miners in manganese mines. I. The specific pulmonary pathology of the miners in manganese mines. M. Wassermann and G. Mihail (Inst. Hyg. Sante Publique R.P.R., Jassy, Ger.). *Arch. Gewerbepath. Gewerbehyg.* 18, 632–57(1961). II. Epidemiology of the chronic intoxication by manganese in the miners in manganese mines. *Ibid.* 65–697.
G. Klimmerle

Nature and mineral content of suspended dust particles in coal mines. Wolfgang Friedrich Waldner. *Bergbau Arch.* 21, No. 2, 43–58(1960).—Dust particles able to enter human lungs were examd. as to size and mineral content. Emphasis was placed on the particle size of 1–5 μ; it was found that the quartz content of the dust varied from 2 to 10%. Chem. compn., particle concn., and particle-size distribution was found to be a function of both the type of coal being mined and the method of mining employed.
Adolph Herbst

Experimental acute poisoning with cadmium oxide in rats. Józef Nowacki (Przychodnia Med. Pracy, Poznan, Poland). *Med. Pracy* 12, 27–30(1961).—Rats were exposed to the dust of the neg. mass used in the manuf. of alk. storage batteries and contg. 57–65% CdO; the concn. was 100 mg./cu.m. air. Cd detd. by spectrophotometry in the ignition residue of particular organs amounted to 0.001 in lungs, 0.09 in liver, 0.05 in stomach, 0.001 in kidneys, heart, and spleen, and 0.005% in brain. The poisoning hazards depended on the size of the dust particles.
Jerzy Lange

The effect of professional carbon disulfide exposure hazards on the development of atherosclerosis. J. Nofer, J. Chojnowski, M. Kawecka, B. Klec, T. Wronska-Szpakowa, and Z. Wyszomirska (Inst. Med. Pracy, Lodz, Poland). *Med. Pracy* 12, 101–18(1961).—Extensive clin. and biochem. examn. covered 182 workers of viscose rayon plant, including 103 regularly exposed to CS_2. The most frequent changes noted in the latter group were: vascular changes in the retina, coronary changes (electrocardiograms), increased serum cholesterol and phospholipid levels, increased β-lipoprotein/α-lipoprotein ratio, increased cholesterol/phospholipid and total cholesterol/free cholesterol ratios, and increased serum total protein level.
Jerzy Lange

Asbestos silicosis. Konrad Szymczykiewicz (Inst. Med. Pracy, Lodz, Poland). *Med. Pracy* 12, 165–84(1961).—A review with 92 references.
Jerzy Lange

Cholinesterase blood levels in persons working with organophosphates. E. Kluftkova and R. Pospisil (Oddeleni Hyg. Prace, KHES, Brno, Czech.). *Pracovni Lekarstvi* 13, 400–7(1961).—Examn. of 220 agricultural workers handling P-contg. insecticides is described. The characteristic curves featuring the drop and subsequent gradual normalization of the cholinesterase levels in the erythrocytes and plasma are shown and discussed.
L. J. Urbanek

Variations of the carbon monoxide exposure in a gas coking plant. P. Borbely (Univ. Zuerich, Switz.). *Pure Appl. Chem.* 3, 183–201(1961).—The CO-concn. of the air near the head of workmen of a gas coking plant showed considerable variations, exceeding the American tolerance value (MAC) of 100 p.p.m., often more than 10 fold. The simultaneous analyses of the carboxyhemoglobin (COHb) concn. in blood showed that despite this varying CO exposure the COHb satn. of the blood during and after work never exceeded 10%. Of workmen employed in the coking plant for 21 years, no injurious effect to health as a result of the repeated inhalation of CO in subclin. doses could be proved.
G. Klimmerle

Comparative investigations on lead intoxication of animals placed in different departments at a printers (different

logton). *Am. J. Cardiol.* 5, 594–603(1960).—Infusion of adrenaline (I) increased heart rate (a decrease occurred when the hypertensive effect was great). Noradrenaline infusion caused a decrease of heart rate but, after atropine was given, its effect became similar to that of I. a
C. R. Raha

Some similar effects after large doses of catechol amines and myocardial infarction in dogs. H. M. Maling, B. Highman, and E. C. Thompson (Natl. Heart Inst., Bethesda, Md.). *Am. J. Cardiol.* 5, 628–33(1960).—In dogs, large doses of catechol amines cause sustained ventricular hypersensitivity assocd. with myocardial fatty changes. Both catechol amines and infarction elevate serum glutamic-oxalacetic and glutamic-pyruvic transaminases, lactic dehydrogenase, and alk. phosphatase. b
C. R. Raha

The hyperuricemic effect of chlorothiazide (Diuril) in pregnant women. Preliminary report. Irving Siegel and Alvin Dubin (Chicago Med. School, Chicago). *Obstet. and Gynecol.* 15, 226–8(1960).—The administration of chlorothiazide resulted in a gradual rise of the uric acid content of the blood in pregnant women, toxemic and nontoxemic.
C. R. Raha

Effect of the relaxing hormone on the laboring human uterus. W. G. Slate and W. F. Mengert (Univ. of Illinois, Chicago). *Obstet. and Gynecol.* 15, 409–14(1960).—Relaxin did not affect human uterine labor. c
C. R. Raha

Clinical, bronchographic, radiological, and physiological observations in ten cases of asbestosis. G. L. Leathart. X
Brit. J. Ind. Med. 17, 213–27(1960).—Discussion with 58 references.
Andrew L. Reeves

Toxicity of copper trichlorophenolate established by chamber exposure of animals. I. A. Arnol'di, Kh. Z. Lyubetskii, and A. A. Akhmerova. *Gigiena, Toksikol. i Klin. Novykh Insektofungitsidov, Trudy 1-oi (Pervoi) Vsesoyua. Nauch. Konf., Kiev.* 1957, 304–8(Pub. 1959).—The air in cottonseed-treatment plants showed 1.6–112.6 mg. $Cu(C_6H_2Cl_3O)_2/m^3$. Guinea pigs and rats were exposed to air levels of 0.5–300 mg./m³. A concn. of 83 mg./m³ was lethal after 1 hr. At 0.5–1.0 mg./m³, none of the animals died after 90 days. The toxic threshold is 1.0 mg./m³. d
Herman G. Rempel

Urinary excretion of chlorpromazine in man. Emery E. Haynes (Galesburg State Research Hosp., Galesburg, Ill.). *J. Lab. Clin. Med.* 56, 570–5(1960).—Three major urinary components of ether-sol. chlorpromazine (I): I sulfoxide in the free and bound forms and bound I were eliminated in 5.5–7.0% amts. when patients were receiving 200 mg. I/day. On a higher dosage of 800 mg. I/day, the urinary excretion was 7.0–9.0% of the ingested I. Excretion of I and I sulfoxide dropped significantly the first day after cessation of medication, and decreased further on the second day; small amts. of elimination continued for 4 days. e
Norman G. Roth

Changes in bile canaliculi produced by norethandrolone: electron microscopic study of human and rat liver. Fenton Schaffner, Hans Popper, and Victor Perez (Mt. Sinai Hosp., New York). *J. Lab. Clin. Med.* 56, 623–8(1960).—Data are presented which indicate that norethandrolone (I) exerts a specific effect on bile canaliculi and that jaundice from administration of I is not the result of hypersensitivity. f
Norman G. Roth

Unit discharge of brainstem reticular formation in the cat. II. Effects of catechol, amphetamine, nembutal and megimide. Naosaboro Yoshii, Junji Matsumoto, and Hiroto Ogura (*Univ. Osaka*). *Med. J. Osaka Univ.* 11, 19–33 (1960); cf. *Ibid.* 1–18.—Effects of intracarotid or intravenous injection of catechol, amphetamine, Nembutal, or Megimide on individual neurons of the pontine reticular formation of the cat were studied. All of these drugs exhibited excitatory effects on some neurons and, at the same time, inhibitory effects on other neurons. g
Norman G. Roth

Action of *N*-(1-methyl-2-phenylethyl)-3,3-diphenylpropylamine on the metabolism of serotonin and noradrenaline. Hans Hermann Schöne and Ernst Lindner (Farbwerke Hoechst Akt.-Ges., Frankfurt A.M., Höscht, Ger.). *Arzneimittel-Forsch.* 10, 583–5(1960).—Subcutaneous injection of the title compd. (100 mg./kg.) (I) into rats reduced the serotonin (II) concn. of brain and myocardium by 30%, and the noradrenaline (III) content by 50–60%. At 20 mg./kg., I caused an addnl. fall in III but no change in II. In cats pretreated with iproniazid, I caused a fall in blood pressure and contraction of the nictitating membrane. h
K. Schoen

Experimental gastric ulcer and effect of a new antiulcer drug, Chlorbenzoxamine. C. Radouco-Thomas, C. Lataste-Dorolle, C. Rogg-Effrem, G. Volster, M. Meyer, J. M. Chaumontet, and D. Larue (Battelle Mem. Inst., Geneva, Switz.). *Arzneimittel-Forsch.* 10, 588–601(1960) (in English).—Acute and subacute ulcers were induced in rats by pyloric ligation, immobilization or restraint of the animals, or by chem. compds. (serotonin, reserpine, glucocorticoids, adrenocorticotropin, hypothalamic exts.). The effect of Chlorbenzoxamine (I) on these ulcers was studied. I acts as a protective agent, causing a decrease or disappearance of hemorrhages and a diminution of lesion incidence; it promotes healing time and stimulates formation of healing epithelial and granulation tissues.
K. Schoen

Comparative studies on the action of 3,5-dioxo-1,2-diphenyl-4-butylpyrazolidine on fetal fibroblasts, blood, and bone marrow cells in vitro. M. Albrecht, J. Eschenbach, and V. Kretschmer (Städt. Krankenhaus Moabit, Berlin). *Arzneimittel-Forsch.* 10, 606–12(1960).—Addn. of title compd. (I) up to 75 mg.% to cultures of fibroblasts and bone marrow cells results in a redn. of the mitosis index similar to that obtained by triethylenemelamine and thiotriethylenephosphoramide. In contrast to the latter, I induced marked morphological changes of cellular plasma in concns. which did not significantly influence proliferation.
K. Schoen

The pharmacodynamic action of the new sulfonamide 2-(*p*-aminobenzenesulfonamido)-4,5-dimethyloxazole. R. Deininger and H. Gutbrod (Nordmark Werke, Hamburg, Ger.). *Arzneimittel-Forsch.* 10, 612–19(1960).—The action of the title compd. (I) was compared with that of 6-(*p*-aminobenzenesulfonamido)-2,4-dimethylpyridine (II). In mice the L.D.₅₀ of I is 15.2 orally, 1.285 subcutaneously, and 1.0 g./kg. intravenously; that of II 1.7 g./kg. orally. Feeding of I at 0.5 and 1% of the food intake for a month showed no toxicity. I was rapidly absorbed after oral administration, 80% being excreted in the urine and 9% in the feces. I and II were qual. and quant. comparable in their activity against various strains of bacteria.
K. Schoen

Fate of sulfadimethyloxazole in the human organism. C. G. vom Bruck, L. M. Delis, E. Serick, and V. Wolf (Nordmark Werke, Hamburg, Ger.). *Arzneimittel-Forsch.* 10, 621–6(1960).—The absorption and excretion of 1–4 g. doses of 2-(*p*-aminophenylsulfonamido)-4,5-dimethyloxazole (I) has been studied. Max. serum concns. were attained 2 hrs. after oral administration; 65–71% were excreted within 24 hrs. After normal daily dosage, equal serum levels were found between the 2nd and 9th day, the mean total excretion was 91%. No binding of I to blood cells was observed. Paper chromatography and electrophoresis showed that I was degraded to various metabolites which were sol. in urine.
K. Schoen

Tissue affinity of sulfadimethyloxazole. W. Hinz, (Kreiskrankenhaus Pinneberg, Ger.). *Arzneimittel-Forsch* 10, 626–8(1960).—One and one half and 12 hrs. after oral administration of 2 g. sulfadimethyloxazole (I) to women, the concn. of I in serum and in freshly extirpated uterine tissue was detd. The distribution quotient for tissue:serum was 0.5 in both cases.
K. Schoen

Comparative studies on the effect of common coronary vasodilators in anesthetized and waking dog. J. Döner and E. Wick (Univ. Giessen, Ger.). *Arzneimittel-Forsch.* 10, 631–6(1960).—Blood pressure, coronary circulation, and cardiac frequency in the normal and anesthetized dog were detd. after administration of a no. of drugs. Persantin had a better effect with regard to intensity and duration of increase of circulation than papaverine (I) and nitroglycerine (II). Administration of I and II was often followed by a primary or secondary decrease of coronary circulation, probably as a result of hemodynamic changes of circulation. Hydroxyethyltheophylline, aminophylline, and "4,4'-diethylamino-ethoxyhexestrol" (Trimasyl) had only slight effect on coronary circulation; morphine showed an occasional effect. Com. organ exts. Recosemin and Lacarnol as well as adenosine triphosphate had no effect.
K. Schoen

Action of a pyrimidopyrimidine derivative on the metabolism and oxygen supply of the heart. W. Lochner and M. Nasseri (Med. Akad. Düsseldorf, Ger.). *Arzneimittel-Forsch.* 10, 636–8(1960).—The action of 2,6-bis[bis(hydroxyethanyl)amino]-4,8-dipiperidinopyrimido[5,4-*d*]pyrimidine (Persantin) (I) on the cardiac metabolism of the dog i

quinine, phenol, and pyrogallol. Relations to chem. structure are discussed. Discordance between reactions to resorcinol and other dioxybenzols is explained by biologic variations in group responses. Patch-test studies with chem. unstable hydroxy— hydroquinone are reported. Data do not substantiate the con- a cept that resorcinol is first oxidized to a trioxybenzol prior to fur- ther oxidn. to a quinoid. J. R. Sampey

Mercury excreted in the urine in relation to length of exposure in workers. A. Dudra, L. Kovanic, and A. Rimarova (Univ. P. J. Safarika, Kosice, Czech.). *Bratislav. Lekarske Listy* 42 II, 635–9(1962). Examn. of 41 workers exposed to an atm. — contg. 250–400 γ Hg/cu.m. air revealed that those who have been working in this atm. for 2–6 years showed a temporary decrease in the excretion of Hg. An increased excretion (up to 17–18 γ/ 100 ml. urine) was observed after the 7th year of employment. L. J. Urbanek

Chronic mercury poisoning. B. Gombos, A. Dudra, J. b Magdo, L. Benicky, and A. Rimarova (Univ. P. J. Safarika, Kosice, Czech.). *Bratislav. Lekarske Listy* 42 II, 540–8(1962). Long-term observation of 50 workers exposed to Hg vapors in an atm. contg. 400–2000 γ Hg/cu.m. air presented varied neuro- logical complaints. Workers exposed for less than 5 years showed an increased incidence of chronic gingivitis; after 5 years of ex- — posure a marked increase in no. of paradental atrophies and paradentoses, only isolated cases of mild anemia, and no renal disorders. Injections of Ca ethylenediaminetetraacetate and of dimercaprol increased urinary excretion of Hg. L. J. Urbanek

The influence of processing products of sulfur-containing crude c oil on the functional state of the gastrointestinal tract. V. A. Sukhanova (Inst. Hygiene and Occupational Diseases, Ufa). *Gigiena Truda i Prof. Zabolevaniya* 6, No. 10, 7–11(1962). The chronic action (4 months) of cracking gas, contg. 0.05–0.07 mg. H_2S/l. on white rats leads to a lowering of the uropepsin ac- — tivity as detd. by a modified West-Idel'son method (*CA* 53, 8262*f*). The activation of uropepsin and its subsequent activ- ity were investigated in one ml. (rather than 0.1 ml.) of urine taken from the whole quantity collected for 18 hrs. The modified method reflects the character of the gastric secretion and can be recommended in toxicological investigations. The intensity of inclusion of radioactive methionine in the pancreatic protein after d stimulation with pilocarpine was lower after the action of crack- ing gas. David Franklin

Toxic-chemical injury of the liver with styrene under produc- tion conditions. B. Ya. Kats (Med. Inst., Voronezh). *Gigiena Truda i Prof. Zabolevaniya* 6, No. 10, 21–4(1962). Liver en- — largement (in 30.2%), disturbance of the antitoxic function of the liver (in over 99% as shown by the Quick-Pytel test), and raised blood bilirubin level (in 35.4%) were observed in these percentages of 526 individuals engaged in the production of divinylstyrene synthetic rubber. Paper electrophoresis of the blood serum showed decreased albumin (to 35–45%), raised e β-globulins (to 15–22%) and raised γ-globulins (to 20–28%). A tendency toward leukopenia was noted in 30.5%, and toward reticulocytosis in 58.5% of the individuals. The results of the $HgCl_2$ test were lowered to 1.6–1.7 ml. in 25% of the cases, and the Weltmann serum coagulation test was lengthened to the — 8–11th test tube in 55.5% of the cases. David Franklin

Health hazards in workers exposed to trichloroethylene vapor. I. Trichloroethylene poisoning in an electroplating plant. Shigeru Nomura (Univ. Med. School Kumamoto). *Kumamoto Med. J.* 15, 29–37(1962). Lab. and medical data are presented for 6 workers acutely exposed to trichloroethylene (I) from a de- f greasing operation. Measured atm. concns. of I ranged from 115 to 384 p.p.m. Predominant symptoms reported were head- ache, muscle and joint pains, and various neurological manifes- tations. Narcosis was observed. Urinalysis yielded urobilino- gen in 5 of the 6, sugar in 4, and albumin in 4. Hematologic abnormalities observed in all exposed were an increased γ-globu- — lin fraction and a decreased albumin fraction. Pos. 24-hr. cephalin-cholesterol flocculation (CCF) tests were observed in 6 cases. On the basis of this test and hyperglobulinemia obser- vations, it was concluded that liver damage occurred, and it was suggested that the present Japanese max. allowable concn. for I be reduced. Ronald L. Kathren

Acute intoxications with fluoride compounds. Michal Bobo- siewicz (Agr. School, Wroclaw, Poland). *Med. Weterynar* (Poland) 16, No. 7, 415–17(1960). Description are given of clin. symptoms and anatomic and pathol. alterations in group intoxica- tions with fluoride compds. from a prepn. for impregnation of wood and in pigs treated with NaF. M. Trenkner

Chronic effects of small and medium concentrations of carbon monoxide in workers of the metallurgical industry. Gh. Cadariu, V. Crisan, Gh. Ciuhandu, L. Seles, and A. Dankner (Inst. Hyg. Publ. Health, Timisoara, Romania). *Proc. Intern. Congr. Occupational Health, 13th, New York* 1960, 237–8(Pub. 1961), h Ger.). *Proc. Intern. Congr. Occupational Health, 13th, New Yo* 1960, 798–800(Publ. 1961)(in German). In workers in explosiv industries involved in nitration, gelatination, mixing, a filling of cartridges, dinitroglycol (I) may enter the body orally percutaneously. The symptoms of I poisoning are listed. T max. concn. of I in the working environment permissible Germany is 0.25 p.p.m.; this value is based on I uptake by i halation only; it should be lower when there is any risk of per tration via the skin. F. W. Seume

The influence of carbon disulfide absorption on the excreti and distribution of administered radiosine. T. Szpakow J. Liniecki, and D. Brykalski (Inst. Occupational Med., Lod Poland). *Proc. Intern. Congr. Occupational Health, 13th, N York* 1960, 800–1(Pub. 1961). Twelve female rats averagi 250 g. were divided into 2 groups of 6 each. The first group w given 0.2 ml. CS_2/kg. for 39 days. The 2nd group acted as control. After 35 days the rats were given 40 γ (7.6 μc.) Zn in an acetate buffer soln. pH 5.6. Zn^{65} content of feces and uri was estd. for 4 days. In the control group the total Zn^{65} elim nated was 2.04% in urine and 87% in feces; 1.23% in urine a 22.1% in the feces of the CS_2-injected rats. In the CS_2-intoxicat rats increased Zn^{65} content was found in 6 out of 10 organs; liver 106%, in kidneys 48%, and in heart 39% over that of t controls. The increase in Zn^{65} content in stomach, brain, lun and pancreas was not significant. Sister Mary Rose, O.S.F.

Effect of fibrous and amorphous asbestos on the collagen co tent in the lungs of guinea pigs. K. Szymczykiewicz and Wiecek (Inst. Ind. Med., Lodz, Poland). *Proc. Intern. Con Occupational Health, 13th, New York* 1960, 801–5(Pub. 196 Twenty-nine male guinea pigs were divided into 3 groups of 1 12, and 5. To the 1st group 40 mg. of fibrous asbestos dust w administered, to the 2nd 40 mg. of amorphous asbestos dust, t 3rd group served as a control. The animals were decapitat 7, 14, 30, 45, 60, and 90 days after dust administration. Af 30 days the difference between mean collagen contents in bo exptl. groups and the control group was significant. In 60 da there was a significant difference in the amt. of collagen in t dry pulmonary tissue between the fibrous asbestos-trea group and the amorphous-asbestos treated group. Collag provoking properties of fibrous asbestos were greater th those of amorphous asbestos. The resulting data showed th the dust content, as SiO_2, in the lungs remains approx. con in the initial period and then increases gradually. Sister Mary Rose, O.S.F.

Research on cyclohexane metabolism. P. Luigi Viola (Un Perugia, Italy). *Proc. Intern. Congr. Occupational Health, 1* *New York* 1960, 818(Pub. 1961). Rabbits, guinea pigs, a rats were given a nonlethal dose of cyclohexane through t peritoneum. Each animal was then closed in an airtight c tainer. Every 12 hrs. for 2–3 days air samples were chec for cyclohexane and urine for glucuronic acid and inorg. s fates. Results showed that 50% of the absorbed cyclohex was eliminated by rats, and 30–40% by rabbits and guinea pi together with a const. increase of glucuronates and org. sulfa and a decrease in ratio of inorg.:total sulfates. Sister Mary Rose, O.S.F

Disturbance of carbon dioxide exchange in silicosis. Worth (Hosp. Bethanien, Moers, Ger.). *Proc. Intern. Cor Occupational Health, 13th, New York* 1960, 826–7(Publ. 19 (in German). Examn. of 154 mine workers having different grees of silicosis indicated that the alveolar space of the l affected by silicosis represents a dead vol. larger than that normal lungs, that is, a larger vol. not participating in g exchange. Thus, in silicosis patients there is impaired vent tion and probably also there are alterations of the alveolar m brane. F. W. Seum

Serum glutamic acid-oxalacetic acid transaminase and aldol activity of persons working with trichloroethylene. V. Lach and H. Pietschmann. *Proc. Intern. Congr. Occupational Hea 13th, New York* 1960, 947–50(Publ. 1961)(in German). The dence that C_2HCl_3 caused injuries to liver cells, led to an inve gation of the activity of serum glutamic acid-oxalacetic transaminase (I) and aldolase for diagnostic purposes. I aldolases showed higher activities with increasing degrees of cell necrosis in the special case of poisoning by C_2HCl_3. degree of hepatotoxic effects in animals and in human be usually paralleled the increase in I and aldolase activity exposure to C_2HCl_3. F. W. Seum

Liver condition of workers of the Kuibyshev chemical suffering from chronic benzene intoxication. I. E. Golubov N. I. Fateeva, and K. V. Malysheva. *Sb. Nauchn. Kazansk. Med. Inst.* 1960, No. 5, 9–12(Pub. 1961). Cas chronic C_6H_6 intoxication were revealed by medical exam workers having contact with C_6H_6 (concn. in air 0.1–0.36 m temp. 28–35°). Leukopenia, thrombocytopenia, and som

pappus heterophyllus (Zalkow) 37. Di-*N*-substituted 2-haloethylamines—*N,N*-dialkyl(or *N*-alkyl)-2-alkyl(or aryl or aryl-alkyl) derivs.—synthesis, reactivity, and pharmacology (Chapman) 35. Thio derivs. of 2,3-dihydro-4*H*-1,3-benzoxazin-4-one—synthesis and pharmacol. properties (Teotino) 38. Sympathetic nervous system blocking agents—derivs. of guanidine and related compds. (Short) 38. Aldehyde hydrazone derivs. in cancer chemotherapy (Wiley) 37. Benzodioxans—isopropanolamine derivs. of 1,4-benzodioxan (Rosnati) 38. Compds. related to carnitine—derivs. of 4-dimethylamino-3-hydroxybutyric acid (Keller) 33. Spasmolytic 1,2,5-trisubstituted pyrroles (Ben-Hal) 37. Comparative study of rates of hydrolysis of cholinolytically active aminoalkyl esters and thio esters (Kuznetsov) 32. Synthesis and diuretic activity of 3,3-spiro-substituted hydrothiazides (Cragoe) 38. Sulfonylureas and liver damage in normal rats and rats with CCl_4 steatosis (Cognetti) 66. 2-Substituted 2*H*-1,4-benzoxazin-3(4*H*)-ones (Wheeler) 38. Optical isomers of some cholinolytic substances (Kuznetsov) 35. Syntheses in the polymyxin series—synthesis of the highly active cyclic decapeptide 7*a* (Studer) 44. Actein (Panizzi) 56. Antitumor antibiotic, cerviacrin—isolation and characterization (Okuma) 56. Physiol. active compds.—aminothiol esters of substituted acetic, chloroacetic, benzilic, and related acids (Buehler) 35. Apparent viscosity and wall-adherence of blood systems (Copley) 65. Anticancer glycoside from *Citrullus colocynthis* (El Khadem) 44. Research of tumor-inhibiting compds. (Ledochowski) 37. Monosubstituted 1,3,4-oxadiazoles (Vincent) 38.

Patents: 7-Alkyl ethers of chrysin (Laboratoires Laroche Navarron) 37. 1-Phenyl-4-butyl-3,5-pyrazolidinedione (Dechamps) 38. Cysteamine orotate ("Farnova", Instituto Biochimico S.p.A.) 38. Phenylethanolamine derivs. (Oesterreichische Stick-stoffwerke A.-G.) 35. 1-(3,4-Dihydroxyphenyl)-2-aralkylaminoethanols (N. V. Philips' Gloeilampenfabrieken) 35. Dihydrodeoxystreptomycins (Ikeda) 43. Antilipemic agents (Goilin) 43.

Reducing exogenous cholesterol levels in animal organisms. Nicholas R. Di Luzio (to U.S. Atomic Energy Commission). U.S. 3,081,226 (Cl. 167–55), Mar. 12, 1963; Ital. Appl. Jan. 7, 1961; 4 pp. A method of reducing cholesterol in the plasma and liver by the administration of a saccharide contg. at least two glucopyranose units joined by a 1–3β glycosidic unit, such as glucan, laminarin, laminaribiose, or laminaritriose is claimed. Rats on an elevated cholesterol diet which were injected 5 mg. daily of zymosan (total 30 mg. dose) showed a redn. in liver ester cholesterol and an increase in liver and spleen wt.

James M. Gillingham

POLLUTION, AND INDUSTRIAL HYGIENE

RALPH G. SMITH

animal was fed 2 lb. of grain daily for 588 days. The high F hay was as toxic as NaF. CaF_2 proved less toxic than either the F residue on the contaminated hay or the NaF. Dental fluorosis was related to the amt. and type of F compd. ingested.

Rudolph Seiden

Absorption of piperazine. G. L. Corona (Univ. Pavia, Italy). *Boll. Soc. Ital. Biol. Sper.* 36, 1073–6(1960). The toxicity of piperazine derivs. is correlated with the rate of absorption from the intestine.

Felix Saunders

Effect of diphtheria toxin on the hemoglobin of the rat. Electrophoretic and chromatographic studies. L. Raimondi and L. Basso Ricci (Univ. Pavia, Italy). *Boll. Soc. Ital. Biol. Sper.* 38, 1184–6(1962). Rats were inoculated with 3000 units of diphtheria toxin and sacrificed 1,2,3,5, and 10 days later. Blood was collected from the aorta. In the electrophoregram of the hemoglobin 2 fractions can be distinguished. The slow fraction starts to disappear after 24 hrs. and disappearance is complete after 48 hrs. This change is still evident after 10 days; then the electrophoregram tends to revert to normal. Changes in the chromatogram of the hemoglobin of rats treated with sublethal doses of diphtheria toxin are also described and illustrated.

S. K. Fleischmann

Asbestosis in experimental animals. J. C. Wagner (Council Sci. Ind. Res., Johannesburg, S. Africa). *Brit. J. Ind. Med.* 20, 1–12(1963). Inhalation of a fine chrysotile dust contg. Si(as SiO_2) 44% (no quartz by x-ray diffraction), FeO + Fe_2O_3 3%, and MgO 37%, caused severe pulmonary lesions in guinea pigs, slight fibrosis (with scanty production of segmented asbestos bodies) in vervet monkeys, and no effect in rabbits. Amosite dust contg. Si (as SiO_2) 51.2% (free SiO_2 7%) and Fe 24.8%, caused marked asbestosis in all 3 species in much shorter time (4 vs. 22 months in monkeys) with plentiful production of (mostly nonsegmented) asbestos bodies. An impure crocidolite dust

due to its high quartz content). Dust concns. ran. 10^3 particles/ml., with 52–58.5% <0.3 μ, 29–31 6–11% 1.0–2.2 μ, and 1.5–9.4% >2.2 μ diam.

Andre

Urinary δ-aminolevulinic acid and porphobilinog posed workers. A. J. de Kretser and H. A. Wal Motors Ltd., Luton, Engl.). *Brit. J. Ind. M* (1963). In 100 workers exposed to Pb, the correl urinary Pb (I), urinary δ-aminolevulinic acid (II coproporphyrin (III) were poor. A raised I was with raised II and III, but levels of up to 2.25 mg. I III/100 ml. were assocd. with I levels below the acce 200 γ/l. The latter cases may represent a ma abnormal susceptibility to plumbism. Where other amts. of Pb cause altered metabolism of heme pre identification of such individuals may have proph cance. 22 references.

Andre

Evaluation of exposure to nitrobenzene. J. Piotrowski, and U. Neuhorn (Inst. Ind. Med., L *Brit. J. Ind. Med.* 20, 41–6(1963). Atm. concns. ranging from 5 to 30 γ/l. were achieved in a chamb at const. surface area to 25–75°, and 7 volunteers w inhalation without skin contact. The amts. of ab 8.4–67.6 mg. (with lung retention decreasing linea during the 1st hr. to 73% during the 6th hr.). U C_6H_5OH (II) increased rapidly during exposure, and during 0–2 post-exposure hrs.; later excretion was traces of II persisting until after 100 hrs. Conver of I into II was, independently of the dose, 6–22 (subjects, and 24–37% in 3 tests of the 7th subje allowable dose of I corresponding to the threshold 35 mg./day. Algebraic equations are given for the excretion from any single urine specimen, and of t tion from the II-excretion rate (2 specimens). $H_2NC_6H_4OH$ was not detected.

Andrew

Fatal addiction to trichloroethylene. W. R. L. School Med., Cardiff, Wales). *Brit. J. Ind.* (1963). A case report of a worker of an electroplati showed evidence of addiction to $CHCl:CCl_2$ (I) va Paresis of the olfactory nerves with intermittent g. ances developed in the course of 9 years, and sudd preceded by severe physical exertion occurred 17 last known exposure. Fatty degeneration of the liv recent lung hemorrhages were found. I content in t mg./100 ml., in liver 7.1 mg., in stomach and conte and in small intestine and contents 14.9 mg. The u 55.5 mg. CCl_3CO_2H/100 ml. 22 references.

Andrew

The toxicity of tetramethyllead solutions to mice N. Castellino, A. Rossi, and R. Mole (Univ. Napl *Ind. Med.* 20, 63–5(1963). Mice and rabbits we cutaneous injections of a Me_4Pb soln. used as a gas (contg. 66.3% other ingredients, including $(CH_3C$ and toluene dyes) (in EtOH–H_2O) in doses ran mg./kg., administered in 0.01 ml. vol./g. body wt. $L.D_{50}$'s were observed in mice at various times a 6 hrs., 1117–1230 (mean 1173); 3 days, 221.5–226.9 10 days, 19.94–43.52 (31.11) mg./kg. At 2 weeks, of controls (receiving EtOH–H_2O only) was 3. mixt. was lethal to 4 rabbits in 3–6 days at 400 m 18–24 hrs. at 800 mg./kg. Mice exposed to the in mixt. (30 min., concn. 1.2–40 g./cu. m., at air fl 1./hr.) showed $L.D_{50}$'s (in g./cu. m.) of 36.4–45. during the 1st, and 4.14–13.36 (8.51) during the single exposure. Hyperexcitability was the leadin mice receiving >300 mg./kg.; there were no sym receiving smaller injection doses, or inhalation dose It is concluded that Me_4Pb has a low toxicity.

Andrew

Fixation and elimination of selenium in the cour tion in the rabbit. J. Roquebert and G. Vitte Chim. Pharmacodyn., Bordeaux, France). *Bull. Bordeaux* 101, No. 4, 237–42(1962). In acute i selenium (I) 1.5 mg./kg. in 3 rabbits and 2 mg. I rabbits in the form of subcutaneous injection of s (II), I is found principally in the liver, kidneys, s chronic intoxication in 5 rabbits receiving I, 0.200 in the form of aq. soln. of II administered through I is found mainly in the liver, kidneys, and spleen, in the lungs than in acute cases. In prolonged int detectable in hair of the rabbit. On the av., 50% eliminated in the urine. Fecal elimination is l administration, higher when given orally than On 3 rabbits after oral administration I of 0.20 mg 1 month in the form of II, the elimination was sig the first 8 days, but decreased progressively till gible after 30–35 days.

air leakage from the drier should be prevented, and exhaust air should be washed with circulating aq. dil. alkali.
Yutaka Tsukano

The effect of aluminum factory waste gases on the content of fluorides in soil and grass. Eugen Hluchan, Jan Mayer, and Emil Abel (Inst. Hyg. Bratislava, Czech.). *Pol'nohospodarstvo* 10(4), 257–62(1964). Fluorides were detd. by titration with $Th(NO_3)_4$ after steam distn. from acid solns. The upper soil layers near the Al factory showed fluorides in concns. up to 91.0 mg. %. The grass samples contained fluorides up to a value of 1138.7 mg. F^-/100 g. of dry matter. The content of F^- in soil and grass declined with distance from the works. The contents of fluorides in dust reached 5.0 mg./100 g. of fresh grass.
Petr Skrabanek

Determination of some air pollutants by ultraviolet spectrophotometry. M. D. Manita. *Predel'no Dopustimye Kontsentratsii Atm. Zagryazn.* 1963(7), 117–25. Naphthalene (I), acetophenone (II), and isopropylbenzene (III) can be detd. in air after dissolving in EtOH by measuring at 220, 244, and 312 mμ. About 0.1, 0.25, and 1.0 ml. of I, II, and III can be detd. Styrene (IV) in a mixt. with dinile can be detd. in air after dissolving in EtOH by measuring at 211.5 and 246 mμ. About 0.25γ IV/ml. can be detd.
Ivo Hynie

Morbidity and mortality in man caused by pulmonary cancer and its relation to the pollution of the atmosphere in the area of aluminum plants. N. N. Litvinov (Inst. Gen. Public Hyg., Moscow), M. S. Gol'dberg, and S. N. Kimlina. *Acta Unio Intern. Contra Cancrum* 19(3–4), 742–5(1963)(in English). The concn. of benzo[a]pyrene in the air near 2 Al plants was 20 times as high as city air. Respiratory tract morbidity and cancer incidence correlated with air pollution.
Richard F. Riley

Asbestos exposure during naval vessel overhaul. William T. Marr (Long Beach Naval Shipyard, Long Beach, Calif. *Am. Ind. Hyg. Assoc. J.* 25(3), 264–8(1964). Shipboard pipecovering and insulating during overhaul and repair is a hazardous trade. Chest x-rays can be misleading for controls as it takes 7 years for asbestosis to develop. There is a difference of opinion on the max. allowable concn. and the effects of long and short fibers. Workers exposed to dry insulation contg. asbestos should wear respirators.
Wm. MacL. Pierce

The effect of certain chemical compounds used in the food industry on the enzymic activity of the liver. A. Sporn and Ileana Dinu (Inst. Hyg., Bucharest). *Acad. Rep. Populare Romine, Studii Cercetari Biochim.* 7(1), 23–34(1964). The effect of BuOAc methylnaphthylketone, ionone, Et gallate and salicylic acid in oral doses of 10 mg. every 2nd day, on the liver enzymes of rats was investigated. After 8 weeks of treatment, an increase of the aldolase, little change of the succinic dehydrogenase, and decrease of aspartic and alanine aminotransferase activities was shown.
BTJQ

Metabolic significance of some toxic solvents. E. Browning *Ann. Occupational Hyg.* 3(4), 231–46(1961). Some important industrial solvents are described with special reference to the influence of their metabolic products upon body enzyme systems and the processes of detoxication. Solvents discussed in this review are benzene, toluene, xylene and related alkyl benzenes, chlorinated benzenes, chlorinated hydrocarbons, alcs., glycols and glycol ethers, chlorinated alcs., and CS_2. Trichloroethanol, the chief metabolite of trichloroethylene, is now regarded as a better criterion of exposure than trichloroacetic acid.
John M. Bryant

Methane diisocyanate: a respiratory hazard? E. O. Longley (Dept. of Public Health, Sydney). *Arch. Environ. Health* 8(6), 898(1964). Of 12 employees in a railway workshop 7 developed asthmatic breathing, 11 had retrosternal soreness, 12 experienced chest constriction, 10 had cough persisting for 7–10 days, 2 had pain behind the eyes, 1 was depressed for 24 hrs., 2 had headache, 2 had nasal discharge, and 1 had insomnia after exposure to mist of methane diisocyanate (I) generated during application of rigid foam insulation. The applicators wore protective clothing and respirators, but the affected workmen were in other parts of the shop. Symptoms disappeared after 10 days.
Raymond Zehnpfennig

Clinical and physiopathological aspects of asbestosis. Emilio Sartorelli (Univ. Milan). *Beitr. Silikose-Forsch., Sonderband* 5, 505–14(1963)(in German). The pathol. aspects of asbestosis are reviewed in relation to the phys. structure and chem. compn. of asbestos. New data are given on 74 patients with asbestosis, including changes in the O and CO_2 levels of the blood. Impairment in lung ventilation and diffusing capacity often produce markedly diminished working efficiency. 51 references.
W. C. Tobie

Functional condition of the parenchymatous organs of workers in the Kapron industry. A. A. Bashirov (Inst. Ind. Hyg., A

the arterial pressure and cardiac rhythm are thought to be secondary.
John Howe Scott

Occupational cutaneous reactions to epoxide and phenol formaldehyde resins. Lesław Grzegorczyk, Danuta Dobrogowska-Potoczna, and Stanisław Kowal (Wojewódzka Przychodnia Med. Pracy, Rzeszow, Poland). *Polski Tygod. Lekar.* 17(50), 1942–4(1962). Occupational dermatoses, eczema, and partial destruction of nails were observed in 28% of workers exposed to epoxide and phenol-formaldehyde resins. Almost all workers examd. suffered itching and burning pains of hands.
Jerzy Lange

Effect of naturally radioactive elements of the uranium-radium series on the hemopoietic system of uranium miners. Halina Dominas, Janina Boguslawska-Jaworska, and Wanda M. Dobryszycka (Zaklad Leczniczo-Zapobiegawczy, Kowary, Poland.) *Polski Tygod. Lekar.* 18(16), 561–3(1963). The following characteristic data were reported on examg. the hemopoietic system of several U miners (no. of patients examd., polymuclear leukocytes, lymphocytes, erythrocyte vol., hemoglobin %, and clotting time in min. given): employed <6 years, 1.1, 49.1, 45.3, 111, 6.8, 16; employed 6–10 years, 16, 49.5, 43.0, 108, 6.8, 17; employed >10 years, 26, 44.0, 50.0, 109, 6.1, 19.2; controls, 8, 58.3%, 33.0%, 104, 1.6%, 10.1.
Jerzy Lange

Determination of basic properties of lead dusts. Janusz Girczys. *Rudy Metale Nieżelazne* 8(11), 447–50(1963). Determination and sedimentation analysis of dusts present in Pb factories are described. The results gave some indications as to the effect of protective masks.
Z. Kurzyka

Practical importance of the test of the resistance of the skin to the action of alkali. A. Czernielewski. *Symp. Dermatol., Corpus Lectionum, Univ. Carolina, Prague 1960* 1, 84–5(Pub. 1962)(in French). Among foundry workers who showed a resistance to alkali on skin testing, 6 of 83 developed cutaneous changes, whereas 22 of 47 that were sensitive to alkali developed dermatosis. The resistance of the skin of individual subjects varied when tested periodically. At times when they were sensitive to alkalies the skin gave pos. tests to other allergens.
A. Dietz

Cement dermatitis. Ch. B. Calman. *Symp. Dermatol., Corpus Lectionum, Univ. Carolina, Prague, 1960* 1, 232–8(Pub. 1962)(in English). Allergic sensitivity to cement is due to chromate. The ratio of Cr(III) to Cr(VI) and its raw materials differs greatly. Much of the Cr(VI) may be derived from Cr(III) by oxidn. during manuf. In lab. expts. cement slurries with no chromate before heating, showed appreciable amts. after heating to 1400° in a Pt crucible. The potentially dermatitic properties of cement are alky., hygroscopic property, the particulate matter, and chromate allergy. Cement dermatitis does not readily clear up when the patient changes his work. When the patient has had dermatitis and recovered, he does not necessarily relapse when he returns to the same work. These points suggest that allergy to chromate is not the major factor in cement dermatitis.
L. Bukunovics

Professional dermatoses and sexavalent chromium. L. Fandeev and S. Z. Borodina. *Sympt. Dermatol., Corpus Lectionum, Univ. Carolina, Prague, 1960* 1, 254–60(Pub. 1962)(in Russian and English). 32.4% of the workers of electroplating plants, who were exposed to CrO_3, CrO_4^{--}, and $Cr_2O_7^{--}$ as well as alk. solns., suffered from allergic dermatoses and eczemas. CrO_3 was proved to be an etiological factor by compress skin tests (0.5% $K_2Cr_2O_7$) which were pos. in 54.8% of the exposed workers, but only in 10% of the rest.
G. Winkelsberg

The frequency of subclinical allergy to chromates in professionally exposed, compared to unexposed persons. H. Polick *Symp. Dermatol., Corpus Lectionum, Univ. Carolina, Prague 1960* 1, 261–6(Pub. 1962)(in German). Persons who were professionally exposed to chromates (305 cement and construction workers, 105 offset printers, and 25 galvanizers) and 110 controls were tested with the compress skin test (the exposed with 0.08–0.5% $K_2Cr_2O_7$ solns., the controls with up to 3.2% CrO_4^{--}). A mean of 16.1% pos. reactions was found in the exposed group, and only 1.8% in the controls. All reactions visible after removing the compress were counted pos.
G. Winkelsberg

Occupational skin injury during the preparation of vitamin B_1. K. Kadlec and L. Hanslian. *Symp. Dermatol., Corpus Lectionum, Univ. Carolina, Prague, 1960* 1, 302–13(Pub. 1962)(in German). Patch tests were carried out on 15 occupational eczema diseased workers from a vitamin B_1 (I) factory. Only all the raw materials and intermediaries used for the preparation of I, only a 0.3% aic. soln. or oily suspension of 2-methyl-3-amino-4-methoxymethyl-5-cyano-6-chloropyridine (II) gave pos. patch tests. Exptl. eczemas were provoked by 1% II or II-Ag and the other compds. used in I processing as well as if in alk.

sivard (Univ. Paris). *Nature* 204(4956), 387–88(1964); cf. *CA* 60, 2244*d*. DL-Thyroxine, 200 γ or 1 mg./kg., injected intraperitoneally daily into mice, increased the toxicity of subsequent injections of DL-amphetamine sulfate and ephedrine hydrochloride, depending on dosage and duration of hormonal treatment. BBJN

Panmyelopathy from exposure to toluene; comments. R. Hoschek. *Zentr. Arbeitsmed. Arbeitsschutz* 14(8), 189(1964) (Ger). Pure toluene contg. <0.03% benzene has no appreciable hepatotoxic activity. Infectious etiology is suggested for a case of alleged poisoning. Concluding remarks. H. Gattaz. *Ibid.* 190. Polemic. Andrew L. Reeves

Phosphorylated thiocholine and choline derivatives. 1. General toxicology and pharmacology. Sten-Magnus Aquilonius, Torsten Fredriksson, and Anders Sundwall (Res. Inst. Natl. Defence, Sundbyberg, Swed.). *Toxicol. Appl. Pharmacol.* 6(3), 269–79(1964). Diethoxy, diisopropoxy, methylethoxy and methylisopropoxy derivs. of (2-dimethylaminoethylthio)phosphine oxide, phosphorylthiocholine, (2-dimethylaminoethyl)phosphine oxide, and phosphorylcholine were screened for acute toxicity in the mouse and rabbit, and for *in vitro* inhibition of cholinesterase activity of human erythrocytes and plasma. Twelve compds. prepd. according to Tammelin were used (*CA* 52, 13816*g*). Intraperitoneal $L.D._{50}$ values of the O analogs in mice ranged from 1000 to 1310 micromoles/kg.; the corresponding range for the S analog was 0.074–140 micromoles/kg. And. cholinesterase activities (human erythrocytes), expressed as the neg. log of the inhibitory dose(pI_{50}) ranged from 4.6 to 4.7 for the O analogs, and from 5.8 to 9.4 for the S analogs. A correlation was evident between the pI_{50} and the $pL.D._{50}$ (neg. log of $L.D._{50}$ expressed in moles/kg.) of the S analogs. Effects on blood press., heart rate, respiration, and neuromuscular and ganglionic transmission in the anesthetized cat were investigated for 5 of the compds., viz. methylisopropoxy(2-dimethylaminoethylthio)phosphine oxide, methylisopropoxyphosphorylthiocholine, methylisopropoxy(2-dimethylaminoethyl)phosphine oxide, methylisopropoxyphosphorylcholine, and diethoxy(2-dimethylaminoethyl)phosphine oxide. The S analogs of this group gave essentially the same effects as did Sarin, though the effects developed much more slowly than after Sarin. The O analogs in this latter group evidenced pharmacol. effects attributable to direct actions on cholinergic receptors. Substitution of the S by O thus reduced the potency of the compds. and also produced a change in the mechanism of action. Frank A. Smith

The acute oral toxicity of sodium chloride. Eldon M. Boyd and M. N. Shanas (Queen's Univ., Kingston, Can.). *Arch. Intern. Pharmacodyn.* 144(1/2), 86–96(1963)(Eng). The median lethal dose of NaCl given orally to young adult albino rats on an empty stomach was 3.75 g./kg. body wt. The mean interval to death was 8.6 hrs. The reaction in males was similar to that in females. The clin. syndrome included convulsive movements, diarrhea, muscular rigidity, prostration, and death due to respiratory failure. At autopsy, dehydration and vascular congestion were present in most organs except skeletal muscle, lungs, and skin. Congestion was esp. marked in the meninges and brain. Columnar epithelium lining the gastrointestinal tract was lysed. Survivors had a brief convalescent anorexia, polyuria, fever, and acidosis; appearance, wts., and water content of organs were essentially normal at autopsy 2 weeks after dosing. The cause of death, therefore, was respiratory failure associated with an acute encephalopathy, accompanied by a fulminating gastroenteritis and dehydration and congestion of many organs due to oral administration of a single lethal dose of NaCl. TCCG

Biol. Abstr. 45(19), Abstr. No. 81607(1964).

The form and changes in the form of asbestosis bodies (in lungs). R. Rath. *Beitr. Silikose-Forsch.* No. 81, 3–10(1964) (Ger). Old and new data are given on the so-called asbestosis bodies occurring in the lungs in fatal asbestosis. Such particles arise from the inhalation of fibers of the chrysotile (I) type of asbestos. Since I has the form of a tube, the formation of asbestosis bodies is interpreted in terms of the diffusion of dissolved Si, Fe, and Mg out of the ends of the tubes of I (whose chem. compn. is interpreted in relation to reactions in the lung tissue). The breakdown of the bodies may result from a breakup of fibers arising from a local narrowing of the tube diam. caused by diffusion of sol. materials. 15 references. W. C. Tobie

Lung lesions observed one month after intratracheal injection (in rats) of coesite containing 1.5 percent quartz. Heinz Breiger and Paul Gross (Jefferson Med. Coll., Philadelphia, Pa.). *Beitr. Silikose-Forsch.* No. 81, 43–50(1964)(Eng). Intratracheal injections of coesite dust gave a marked, generally uniform local, cellular and stromal reaction. The coesite lesions contained much reticulin and collagen in contrast to lesions produced by quartz dust alone. The effects of coesite (<0.5 μ) were [illegible] than quartz dust alone (1–3 μ), the

Petah Tiqva, Israel). *Brit. J. Ind. Med.* 21(4), 299–303(1964) (Eng). In the manuf. of ZnO from old airplane batteries contg. 0.6% Hg as Zn amalgam, Hg vapors were released into a plant atm. at an estd. level of 0.3–2.0 mg./m.³ Severe poisoning developed in 7 out of 25 plant employees, with tremor as the leading symptom, Hg level (in γ/l.) of 103–212 in urine, 3.6–9.1 in the cerebrospinal fluid of 6 cases, and 82.7 of the 7th case. Initial penicillamine treatment was abandoned because of skin reactions; BAL was of no apparent benefit. The other workers (generally with less exposure) presented mild or no symptoms, with 89–360 γ Hg/l. urine on 1st examn. Andrew L. Reeves

A follow-up study of workers from an asbestos factory. P. C. Elwood, A. L. Cochrane, I. T. Benjamin, and D. Seys-Prosser. *Brit. J. Ind. Med.* 21(4), 304–7(1964)(Eng). Men surviving 1st occupational exposure to chrysotile dust by 15 or more years show 2.3 times the expected mortality from pulmonary, bronchial, or pleural neoplasms, but there was only 1 case of mesothelioma. Andrew L. Reeves

Plasma porphyrins in lead workers. H. A. Waldron (Vauxhall Motors Ltd., Luton, Engl.). *Brit. J. Ind. Med.* 21(4), 313–17(1964)(Eng). In 50 workers exposed to Pb, total porphyrin (I) in plasma averaged 0.7, and coproporphyrins (II) in urine 10.6 γ/100 ml. (vs. 0.2 and 0.7 in controls); individual correlatability between the 2 values was poor. II comprised all of I in the plasma of controls but some protoporphyrin was present in the exposed group. Urinary I in 4 exposed workers also included compds. having R_f values of 0.65 and 0.33 (in Me_2CO–Et_2O–HOAc, 5:5:1), corresponding to porphyrins with 3 and 6 carboxyl groups, resp. These values are slightly lower than those of Eriksen (*CA* 47, 10603*f*). Total hemoglobin showed no difference, and there were no symptoms of intoxication. Andrew L. Reeves

Effect of aminoalkylphosphonic acids on experimental intoxication with beryllium. O. G. Arkhipova, T. A. Kochetkova, M. V. Rudomino, T. Ya. Medved, and M. I. Kabachnik (Inst. Heteroorg. Compds., Moscow). *Dokl. Akad. Nauk SSSR* 158(5), 1235–7(1964). Administration by intraperitoneal injection of $[CH_2NHCMe_2P(O)(OH)ONa]_3$ (I) at 500 mg./kg. resulted in survival of nearly all rats after injection of lethal doses of $BeCl_2$. Lower concns. gave less protection; Na citrate used in conjunction with I also gave considerable survival values. Pyridoxine or glucuronic acid, used jointly with I, also gave similar results. Anatomically animal organs after Be intoxication showed severe disruption of circulation. These effects are largely controlled by I. The enhancement of the action of I by citrate, pyridoxine, or glucuronic acid is possibly explained by mass hindrance of the union of Be with proteins, making the latter more available for complex formation and eventual excretion. Stable Be complexes are also formed by $[CH_2NHCH_2P(O)(ONa)OH]_3$ and $[CH_2N(CH_2CO_2H)CH_2P(O)(OH)]_3$. Na, K, and Ca salts of the latter are described. G. M. Kosolapoff

Biol. tests with these are reported.

Some data on the beryllium level in biological media during beryllium. P. A. Rozenberg and A. A. Orlova (Inst. Ind. Hyg. and Occupational Diseases, Acad. Med. Sci., Moscow). *Gigiena Trudа i Prof. Zabolevaniya* 8(9), 42–6(1964)(Russ). Be concn. in 24-hrs.' urine was examd. in patients with chronic beryllosis and in healthy persons that had worked with Be for some years. In most cases in both the groups no Be was found, but 2 healthy men excreted 1.77 and 3.16 γ/24 hrs. 1 and 3 years after Be exposition. Be in blood was not proved in any case. Then 40 mg. of Be as BeO was administered into rats by intratracheal technique. After 2, 3, and 4 months the rats were killed and the amt. of Be in the internal organs and blood was examd. The blood Be level decreased and was = 0 in the last group, while the content in liver and kidneys did not considerably change. Be can be stored in an organism for many years and small amts. are excreted with urine periodically. 15 references. Ivo Hynie

Renal function in initial manifestations of chronic lead poisoning. V. I. Dynnik (Inst. Ind. Hyg. and Occupational Diseases, Kharkov). *Gigiena Truda i Prof. Zabolevaniya* 8(9), 57–9 (1964)(Russ); cf. *CA* 61, 8810*c*. The functional state of kidneys and some other clin. symptoms were followed in 99 cases of slight chronic Pb poisoning. The av. Pb concns. in blood and urine were 0.06 and 0.2 mg. %. In blood occurred reticulocytosis, polychromasia, and anemia (70–75%), the porphyrin urine level was 0.09 mg./l. A decrease of kidney blood-plasma flow (400 ml./min.) and of creatinine clearance and a rise of the filtered fraction (30%) were observed. Pb probably causes spasms of the vasa efferentia in kidneys. Ivo Hynie

Pharmacological comparison of the binding of iron and other metals. J. Tripod (CIBA A.-G., Basel, Switz.). *Iron Metab., Intern. Symp., Aix-en-Provence, France* 1963, 503–17, discussion 518–24(Pub. 1964). Some data on the action of desferrioxamine and EDTA were presented. The results showed that Fe only h was deposit

0–36 months, and wt. 0–15 kg.) given a single $^{239}PuO_2$ treatment. translocation and sepn. through urine and feces were greatest within 1 month when aerosols with very small particle diams. were used. With particle sizes of 4.3 μ, the half-time for lung retention was ~300 days, with simultaneous accumulation in the lymph nodes, which gave a total body retention of Pu of ~1500–800 days. The distribution was completely different after Pu inhalation than after the intravenous injections; for example, the urine sepn. rate with inhalations was ~5 times as high as with the injections. From *CZ* 1964(21), Abstr. No. 1427.

MRCR

Presence of mediators in the blood in lead intoxication. II. Acetylcholine in experimental lead poisoning. N. N. Tikhonov. *Izv. Akad. Nauk Kaz.SSR, Ser. Med. Nauk* 1964(3), 65–9 (Russ). The concn. of acetylcholine in the blood of dogs given 1 ml. 2.5% $Pb(OAc)_2$ daily rose only slightly and remained at that level until about the 170th day when it rose sharply to about 150 γ/ml. as the condition of the animals became much worse.

John Howe Scott

Effect of edetic acid, bis[2-[bis(carboxymethyl)amino]ethyl] ether, and diethylenetriaminepentaacetic acid on lead-210 retention in mice. Dariusz Brykalski and Danuta Depczyk (Inst. Med. Pracy, Lodz, Poland). *Med. Pracy* 14(6), 439–47(1963). ^{210}Pb (1–4 μc.) was given intravenously to mice in the form of $Pb(NO_3)_2$ in 0.2*N* acetate buffer and immediately followed by edetic acid (I), bis-[2-(dicarboxymethylamino)ethyl] ether (II), or diethylenetriaminepentaacetic acid (III), each given intraperitoneally in the form of the Ca complex dissolved in 0.9% NaCl (0.2–0.4 ml.). The animals were sacrificed 48 hrs. later and the radioactivity detd. in sep. organs. Accumulation of ^{210}Pb in liver, kidneys, femoral bones, other parts of the body, and in the 48-hr. urine and feces (percent of intake) were: with I, 6.3, 2.3, 0.7, 17.4, 66.4, resp.; with II, 6.8, 2.9, 1.6, 26.9, 52.9, resp.; with III, 5.7, 1.9, 0.5, 9.4, 68.2, resp.; in controls, 6.8, 6.4, 2.2, 32.5, 28.4, resp. When the chelating agents were administered in 5 × 40-millimole portions given every other day, the total retention of ^{210}Pb, as found in the 11th day of the expt., was 32.08%, with I 35.98%, with II 28.38%, with III, and 46.77% in controls. When administration of the chelating agents was started on the 5th day of the expt., the final retention values were 72.9, 85.5, and 70.8%, resp.

Jerzy Lange

Serum proteins in asbestosis. Vladimir Medek and Jiri Radl (Oddeleni Nemoci Povolani Koniggratz, Czech.). *Pracovni Lekar.* 16(8), 349–52(1964)(Czech). There was a mild decrease in serum proteins and an increase in the γ-globulins, both in relative and abs. values and more markedly in women, in 30 patients whose serum was investigated by paper electrophoresis, flocculation reactions, and immunoelectrophoresis. Paper electrophoresis of serum proteins is thought of sufficient value as a diagnostic means in asbestosis.

L. J. Urbanek

Elimination of solid particles [silicon dioxide] from the lungs and formation of antibodies. Juraj Perin, Eva Reichrtova, Gertruda Urbankova, and Angelika Vickova (Ceskoslov. Akad. Ved, Bratislava). *Pracovni Lekar.* 16(9), 410–12(1964)(Slo). There was a pos. correlation between the elimination of SiO_2 dust in rats exposed to forced inhalation and the spontaneous production of antibodies (hemolysin). Possible utilization of the results in occupational hygiene is discussed. L. J. Urbanek

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is discussed with reference to the prodn. of sulfmethemoglobin and its possible fate in vivo. Preliminary expts. with armadillo blood showed its oxyhemoglobin and ferricyanide-produced methemoglobin to have absorption spectra qual. like those of human blood pigments.

Frank A. Smith

Changes in thyroid ^{131}I activity in ozone-tolerant and ozone-susceptible rats. Edward J. Fairchild, II, Stuart L. Graham, Mark Hite, Richard Killens, and Lester D. Scheel (U.S. Dept. of Health, Educ., & Welfare, Cincinnati, Ohio). *Toxicol. Appl. Pharmacol.* 6(5), 607–13(1964). Single 5-hr. exposures of male rats to 1, 2, and 4 ppm. of O_3 inhibited the thyroid release of ^{131}I. Under exposure conditions known to produce tolerance to O_3 via repeated 5-hr. exposures to 0.5 or 1 ppm., O_3 did not alter the ^{131}I content of the thyroid. Two 5-hr. exposures to 2 ppm. O_3 followed later by a challenge exposure to 4 ppm. resulted in an increased rate of release of ^{131}I. This tri-phasic response of the thyroid to O_3 indicates that the tolerance phenomenon induced by certain irritant gases is assocd. with, but not necessarily detd. by, a resistant phase of thyroid activity, and suggests activation of humorally mediated mechanisms by O_3 at concns. as low as 0.5 ppm.

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Rudolph Seiden

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MWCR

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E. Tou

Appendix 8

Buhel Encyclopaedia of Medical Practice

1st & 2nd ed.

THE
BRITISH ENCYCLOPAEDIA
OF MEDICAL PRACTICE

INCLUDING

MEDICINE SURGERY
OBSTETRICS GYNAECOLOGY
AND OTHER SPECIAL SUBJECTS

Under the General Editorship of

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VOLUME ONE

ABDOMINAL PAIN TO APPENDICITIS

LONDON
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BELL YARD, TEMPLE BAR
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ASBESTOSIS

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2. AETIOLOGY	139
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Reference may also be made to the following titles:
ANTHRACOSIS PNEUMOCONIOSIS SILICOSIS

1.—DEFINITION

104] Asbestosis is an occupational pneumoconiosis caused by the inhalation of asbestos dust.

Asbestos is the commercial name given to two groups (with their subdivisions) of fibrous, heat- and acid-proof minerals—namely, actinolite and chrysotile. Chemically they are hydrated magnesium silicates containing varying amounts of lime, alumina, iron or manganese, the composition differing with locality. This 'physical paradox', or 'mineralogical vegetable' as it has been termed, can be carded, spun and woven as readily as wool, flax or silk.

Asbestos is of importance in medicine on account of the rapid expansion of the industry during the past twenty years, and of interest because asbestos dust—a silicate dust—has been proved to cause pulmonary fibrosis. Until recent years silica was looked upon as the only mineral responsible for respiratory disability, and silicate dust of whatever composition was regarded as non-injurious. That contention may still be true because asbestos, in addition to its unique physical properties, has unusual chemical characteristics. Weak acids, such as acetic,

dissolve the bases magnesium and calcium, leaving pure silica without destroying the appearance and flexibility of the fibre. This same change is probably brought about by tissue juices in the lungs thus releasing free silica which acts as the fibrosing agent. Support for this view is supplied by the fact that analysis shows the presence of free silica both in the asbestosis bodies *and in the lung* (see p. 141).

The processes of manufacture have been divided into two groups according to the *amount of dust* generated. The 'less dusty' operations are spinning, twisting and plaiting, and the 'more dusty' milling, mixing, carding, weaving and mattress-making. Samples taken by Owen's apparatus show that 90 per cent of the dust particles measured 1·5*μ* or less, and 80 per cent, 2*μ* or less. Long fibres 100*μ* or more in length, and large black, blue and yellow fragments of asbestos are also found. As asbestos fibres owing to their brittleness may split longitudinally beyond the limits of direct microscopical measurement, it may be assumed that *the dust contains many ultra-microscopic particles.*

2.—AETIOLOGY

As would be expected, the disease is more common among those *Incidence* engaged in the *'more dusty' processes.* Merewether gave the following results of the examination of 500 workers in the 'less dusty' and of 845 in the 'more dusty' processes.

TABLE I.—Incidence Rates of Definite *Fibrosis* (Asbestosis) in Workers in the 'Less Dusty' and 'More Dusty' Processes

	Incidence Rate of Asbestosis per Cent			
	0-4 Years Employed	5-9 Years Employed	10-19 Years Employed	20 Years and over Employed
Less dusty processes	0	2·4	8·3	5·0
More dusty processes	0·1	3·1	19·0	42·6

The *shortest period of exposure* to asbestos dust that resulted in death from advanced fibrosis was 4·6 years, and the average exposure in the twenty-seven *fatal cases of pure* asbestosis in England up to 1933 was 13·3 years.

That there *is an increased liability* to tuberculosis appears to be very *Relation to tuberculosis* definite. The risk cannot be estimated from the small number of cases recorded at present and the incidence rate will have to be amended as further statistics become available.

TABLE II.—Forty-two Fatal Cases of Asbestosis and Asbestosis with Tuberculosis

Disease	Number of Deaths	Age at Death			Duration of Exposure in Years			Period between Last Exposure and Death		
		Minimum	Lowest	Average	Lowest	Shortest	Average	Lowest	Shortest	Average
Asbestosis	27	63	26	40·8	27	4·4	12·5	14·3	2 days	2·96
Asbestosis with tuberculosis	15	67	35	41·6	24	3·4	11·3	12·2	0·3	4·6

Of the forty-two fatal cases, fifteen (35·7 per cent) were complicated by tuberculosis. Asbestosis is comparable, in the duration of exposure and average age at death, with the acute forms of silicosis seen in sand-blasters and those employed in the manufacture of scouring powders. Merewether gave the following interesting comparisons:

TABLE III.—Comparisons between all Forms of Silicosis, Asbestosis and Acute Silicosis

Disease	Number of Deaths	Average Age at Death	Duration of Exposure in Years		
			Longest	Shortest	Average
Silicosis (all forms)	311	55·8	62·0	2·3	35·1
Silicosis with tuberculosis	391	52·4	67·0	2·0	31·7
Asbestosis	52	41·9	27·0	1·5	12·4
Asbestosis with tuberculosis	30	37·1	29·0	0·8	9·5
Silicosis (acute)	10	38·8	13·5	4·8	9·0
Silicosis (acute) with tuberculosis	18	38·8	13·2	2·2	7·3

3.—MORBID ANATOMY

Fibrosis of lungs and adhesions

The salient features in the gross morbid anatomy are dense pleural adhesions, which may obliterate the pleural sacs. The bases of the lungs are firmly adherent to the diaphragm. There is a widespread pulmonary fibrosis affecting especially the lower lobes. As the result of fibrosis and pleural adhesions, bronchiectasis develops and may go on to abscess formation. The circumscribed fibrotic nodules characteristic of silicosis are rarely found in asbestosis. On section the fibrosed portions present a greyish-black mottling, dense, airless patches merging into areas less affected. The whole of the lungs are firmer than normally.

Histology

Histologically the lesion is a chronic interstitial fibrosis. In the early

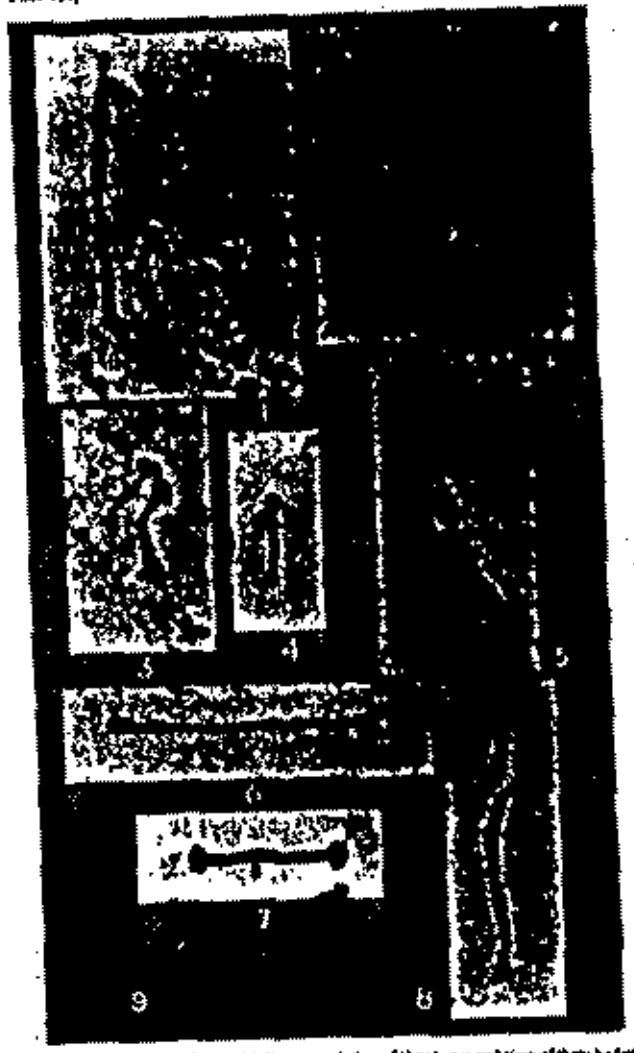


FIG. 11.—Asbestosis bodies, × 400 diameters. A few of the shapes and sizes of these bodies. Elongated dumb-bells, clubs with single bulbous ends, minute forms like a series of discs, single globular forms, etc. 3 and 4 show central core of black opaque mineral, cf. anthracotic bodies. In 5 the golden yellow casing has been fractured, exposing slender asbestos fibre core. The bodies may measure 100 to 120μ. In 9 the colloidal covering has been dissolved, leaving the fine asbestos fibre base. Taken under polarized light. Photomicrographs by W. E. Cooke and C. F. Hill

stages there is fibroblastic proliferation in the alveolar walls and septa, and later, fibrosis becoming more marked, alveolar structure disappears and is replaced by dense fibrous tissue. Bronchiolectasis and chronic bronchitis are frequent features.

Asbestosis bodies

Sections taken from all parts of the lungs contain fine granular dust, large black particles and fragments of asbestos fibre (best seen under polarised light), and in addition the curious bodies which are characteristic of the disease. They are golden yellow in colour and vary in length from 2μ to 140μ or more. They appear as coccal forms single or in streptococcal-like chains, long forms with single or double bulbous ends, branched forms, and as strings of discs. In some a fine filament of asbestos fibre can be seen. There is a central core of asbestos upon which a colloidal combination of tissue-protein and silica has been adsorbed. This colloidal covering does not stain with aniline dyes but gives the Prussian blue reaction for iron: it is soluble in strong acids and alkalis which leave the central asbestos fibre bare. The bodies can be obtained in a pure state by tryptic digestion of the lungs. Their chemical composition is then found to be:

	Per cent
Organic matter	67·80
Inorganic matter	32·20

The composition of the ash was:

Free silica (SiO_2)	5·0
Combined silica	21·10
(Total silica, 26·10 per cent)	
Ferrous oxide	70·55
Magnesium oxide	3·55
Alkalis	0·80

The original asbestos did not contain any free silica and only 2·1 per cent of iron. The free silica in the analysis is probably due to changes in the asbestos fibre brought about by tissue fluids. The iron may possibly be derived from haemoglobin. These bodies are present in myriads in the lungs of patients with asbestosis, but may also be found, although very rarely, in normal subjects. Analogous bodies are seen in anthracosis (see Vol. I, p. 624).

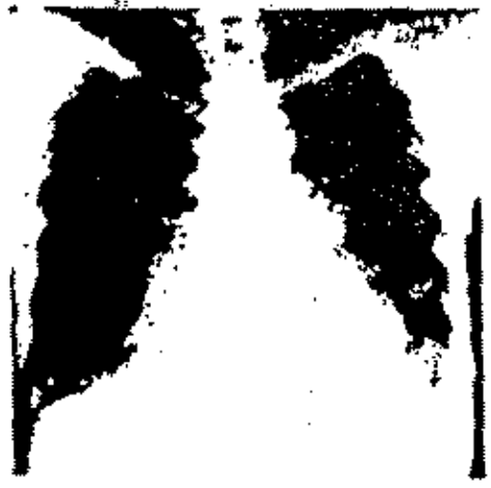
4.—CLINICAL PICTURE

Symptomatology

The onset is insidious. The lung condition may have existed for some years before an attack of influenza or a catarrhal cold focuses attention on it. The symptoms may appear very early, after only two to three years' exposure, or be delayed for fifteen years or more, depending upon the amount of asbestos dust inhaled.

Dyspnoea and cough

Dyspnoea is the most striking and probably the most important symptom. It is progressive whether the patient is removed from work



Early asbestosis in man aged 32 after 12 years' exposure. Perribronchial thickening and mottling, particularly at bases



Moderately advanced asbestosis in man aged 38 after 23 years' exposure. Marked fibrosis both lungs and generalized mottling. (Both radiographs reproduced by kind permission of Dr. A. J. Lanza)

PLATE I

(To face p. 14)

or not, and is primarily due to the pulmonary fibrosis and lack of diaphragmatic excursion, and later to deficient oxygenation and right heart failure. Some patients suffer from recurrent attacks of bronchitis, or chronic bronchitis and bronchiectasis with expectoration, others from a hard dry cough, but in a considerable number this is absent.

Loss of appetite and emaciation are frequent symptoms. The anorexia may be late or may occur whilst the patient is still working. Emaciation may be extreme even in the absence of tuberculosis. Cyanosis and clubbing of the fingers are also constant late manifestations. In addition to 'soreness', 'aching' and 'tightness' across the chest, which are common complaints, acute pain due to dry pleurisy or stretching of pleural adhesions occurs.

Physical signs

The physical signs are those of advancing pulmonary fibrosis with thickened pleurae, i.e. deficient chest expansion, bilateral impairment of the percussion note especially at the bases, weakened respiratory murmur over the bases behind, becoming harsher with prolonged expiration in front and over the upper chest, with fine rales and pleural creaks. With the advent of bronchiectasis or tuberculosis signs of cavitation may be present and spontaneous pneumothorax may occur. Finally oedema of the lungs, ascites and general dropsy supervene.

Fine spicules of asbestos penetrate the superficial layers of the skin, stimulate hypertrophy of the epithelium and produce small corns.

Radiological findings

Radiographs in early stages show a faint homogeneous haze in the lower part of the mid-lung fields, a ground-glass appearance, suggesting interstitial fibrosis. As the disease progresses, the haze spreads downwards through the lower two-thirds of the lung fields almost obscuring the domes of the diaphragm. The diaphragmatic excursion is much restricted. In the advanced stage there is a dense, diffuse fibrosis with prominent trunk shadows, obliteration of the left cardiac border, and pleural thickening. The picture is not in itself characteristic, but is a very valuable aid to the diagnosis (see Plate I).

5.—COURSE AND PROGNOSIS

The disease once established is progressive even if the patient ceases work in the industry, as asbestos dust trapped in the lungs continues to exert its fibrosing effects for many years.

Probable duration of life

The probable duration of life is impossible to estimate on the small numbers at present available, but the gravity of the condition is suggested by the cases in Table II, in which death took place on the average within five years of the last exposure to asbestos dust. This estimate will probably be found to be too pessimistic.

Complications

The risk of tuberculosis must be remembered and acute pulmonary infections—acute bronchitis and pneumonia—often cause death.

6.—DIAGNOSIS

Uses of asbestos

The manifold uses of asbestos in industry during recent years have enormously widened the risk of asbestosis and the disease may crop up in unexpected places. In addition to the mining, milling, carding, spinning and weaving risks, there are risks from the use of asbestos as heat-insulating for boilers and steam-pipes and as electric insulating material, and in the construction of electrical heating devices. It is used for mattress making, and is made up in different forms such as yarns, felts, boards, cloth, rope, cord, twine and threads. Asbestos cloth is made into suits for firemen and fire-proof curtains for theatres. Woven with metal wire it is used for brake linings for cars and machinery; and woven asbestos belts are used as conveyors for cement, clinker and other hot solids. Asbestos rope and string are used for steam-pipe and pump packing; and the acid-resisting properties of asbestos are utilized in filters for corrosive liquids. Pressed into blocks with cement, asbestos is manufactured into fire-proof cement, millboards, wall-boards, shingles and tiles. Asbestos sheeting is used to deaden sound in buildings, and asbestos paper where damp-proof and fire-proof coverings are required. Whole buildings, in fact, are constructed with asbestos materials.

For diagnosis, therefore, a complete and accurate occupational history, the presence of physical signs and symptoms of pulmonary fibrosis together with a good radiogram are the essentials. The presence of asbestosis bodies in the sputum, faeces, or fluid from a lung puncture is corroborative evidence that the fibrosis is due to asbestos. The physical signs, symptoms and X-ray picture are common to other pneumoconioses, but when they are taken with the industrial history a mistake is not likely to be made.

7.—TREATMENT

Prophylaxis

Dust prevention in all the manufacturing process is imperative. In its absence, workers in the more dusty process will not survive ten years. The preventive measures include periodical medical examinations, efficient localized exhaust ventilation at dust-producing points, enclosed mechanical conveyors, wet methods when possible, efficient cleaning systems and the use of breathing apparatus in certain operations.

When the disease is diagnosed the patient should be removed from further contact with asbestos. No measures can alter the lung condition existing at the time of diagnosis, nor apparently stay the advancing fibrosis, but it seems probable that life may be prolonged in hygienic surroundings where further infection is minimized, and useful work still carried on if regulated according to the capacity of the patient.

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PNEUMOCONIOSIS

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Reference may also be made to the following titles:

ANTHRACOSIS ASBESTOSIS
SILICOSIS

1.—DEFINITION

1278.] Pneumoconiosis (πνεύμων, lung; κόνις, dust) denotes fibrosis of the lungs due to the inhalation of particles of dust.

Names of special forms

Descriptive titles have been given to various forms to indicate the causal agent, e.g. [redacted]; anthracosis, due to coal dust; byssinosis, due to cotton dust; ganister disease, due to ganister dust; ptilosis, due to feathers; schistosis, due to schist and slate dust; siderosis, due to iron ore dust; silicatosis, due to the dust of silicates; silicosis, due to silica, quartz, and flint; and tabacosis, due to tobacco dust.

Until recently the pneumoconioses, with the exception of silicosis and [redacted], had not been carefully investigated, and some of the older designations may have to be altered or deleted to conform with modern

views. The action of free silica (silicon dioxide, SiO_2) is the primary cause of the accumulation of coal dust and iron-stone dust, and the titles silico-anthracosis and silico-siderosis are now used to indicate the association.

Neither the poisonous dusts, e.g. lead, arsenic, mercury, brass, and manganese, nor the carcinogenic dusts, e.g. the chromate dusts and cobalt ore dust, nor the infective dusts causing anthrax in wool-sorters, and glanders, aspergillosis, actinomycosis, and other mycotic diseases in agricultural workers, although sometimes causing pulmonary fibrosis, are included here, because by common usage the name pneumoconiosis is confined to the conditions in which dust alone causes morbid changes in the lungs.

2.—AETIOLOGY

(1)—Necessary Factors

To produce morbid changes in the lungs a dust must be biologically active, of sufficiently small size, and inhaled in sufficient quantities for a sufficient time.

(2)—Response of Tissues to Dust

Tissues in all parts of the body of the same animal tend to react to dusts in essentially the same manner.

Experimentally, the subcutaneous, peritoneal, and intratracheal routes have been utilized to ascertain the reactions to dusts. Suspensions of the finely ground dust are made in saline and sterilized. Definite quantities are injected subcutaneously, or into the peritoneal cavity, or passed by a catheter or by tracheal puncture into the lungs.

By the peritoneal method dusts have been classified into those giving an absorption, a proliferative, or an inert reaction. There is evidence, however, that all genera do not react identically and that some differ in their reactions from man. The absorption reaction is that in which the dust entirely disappears from the peritoneum, leaving no scar tissue; the proliferative reaction is that in which the fibrous nodules caused by the dust increase in size up to 112 days; and the inert reaction is that in which, although the amount of dust remains approximately the same throughout the various periods of the experiments (7 to 90 days), the nodules become more flattened, and fine particles are carried over extensive areas of the peritoneum by phagocytes.

Absorption reaction

Proliferative reaction

Inert reaction

The dusts which give the absorption reaction are calcite, limestone, precipitated calcium carbonate, gypsum, and cement. The proliferative reaction is given by free silica dust (quartz, chert, and flint) and by minerals possessing a high silica content. Soapstone, carborundum, jewellers' rouge, anthracite and bituminous coals, iron oxide, titanium oxide, and aluminium oxide give the inert reaction.

Free silica and asbestos are the most active dusts and are the commonest causes of pulmonary fibrosis; they are dealt with under the titles SILICOSIS and ASBESTOSIS (see Vol. II, p. 138) respectively.

(3)—Sizes of Particles

Ninety per cent of the mineral particles found in lungs are less than 5μ in diameter, the vast majority being between 0·1 and 3μ.

(4)—Amount of Dust Inhaled and the Time Factor

The natural protection of the alveoli from damage by dust is very effective. To break down the natural defences the respiratory apparatus must be persistently overwhelmed by large quantities of dust. This is well seen in the case of the sand-blaster. He works in an atmosphere heavily laden with silica dust, and the average duration of employment before the onset of silicosis is 9·5 years, in many cases 2 to 5 years. In stonemasons who spend a large portion of their time in the open the average duration of employment before the onset of silicosis is 38 years.

(5)—Forms of Pneumoconiosis

Thorough investigations have been carried out in only a few industries, and without positive evidence a dust should not be incriminated.

Anthracosis and siderosis

Since free silica dust is the primary causal factor, and neither coal dust nor iron oxide dust alone causes pneumoconiosis, the prefix silico- should be used in speaking of these diseases.

Byssinosis

No evidence exists that cotton dust causes pulmonary fibrosis. In fact all authorities are agreed that the chronic bronchitis and asthma in strippers and grinders in cotton-mills are not due to fibrosis but are expressions of allergy.

Ptilosis and tabacosis

Here again there is no positive evidence that the dusts of feathers, wool, wood, tobacco, terra-cotta, cement, pumice, marble, bone, shell, fur, skins, asphalt, enamel, glass, diamond, iron and steel, straw, flour, grain, jute, flax, hemp, or horsehair cause morbid changes in the lungs, and, until complete investigations have been carried out in the various industries concerned, the case must stand as not proved.

Silicatosis—talc (steatite; soapstone; French chalk)

The most important of the silicates is asbestos (see Vol. II, p. 136), but other silicates have been incriminated, many on very insufficient data. As most of the silicates occur in company with quartz, it is of prime importance in considering the effects of silicate dusts to eliminate the presence of that mineral. That a true silicatosis other than asbestosis does occur is shown by Drussen and DallaValle in their investigation of the workers in two Georgia talc mills.

Talc, steatite, soapstone, or French chalk is a native hydrated magnesium silicate $(MgO)_3.(SiO_2)_4.H_2O$, extensively used in commerce.

The 66 workers of the Georgia talc mills were divided into three

groups according to the amount of dust to which they had been exposed: (i) 33 mill workers, exposed to a concentration of 300 million particles of dust per cubic foot; (ii) 13 miners exposed to an average concentration of 135 million particles of dust per cubic foot; and (iii) 20 additional workers exposed to an average concentration of 17 million particles of dust per cubic foot. The results are shown in the accompanying table.

Incidence of Pneumoconiosis in Workers exposed to Different Concentrations of Dust in Talc Mills

Occupation	Workers Exposed	No. of Dust Particles per Cubic Foot	No. of Cases and Stages of Pneumoconiosis		
			I	II	III
Sawyers, packers, and crushers	33	300 million	8	5	3
Miners	13	135 million	6	0	0
Additional workers	20	17 million	0	0	0

The rock did not contain any free silica; the pneumoconiosis was therefore attributable to silicate dust alone.

Other silicates — mica $(Al_2O_3)_3.(K_2O)(SiO_2)_6.(H_2O)_2$, phlogopite $(Al_2O_3)(K_2O)(MgO)_6.(SiO_2)_6.(H_2O)_2$, sericite $(Al_2O_3)_3.(K_2O)(SiO_2)_6.(H_2O)_2$, sillimanite $(Al_2O_3)(SiO_2)$, norite and orthoclase basalt, basic beryllium carbonate, and kaolin or China clay $(Al_2O_3)(SiO_2)_2.(H_2O)_2$— have been suspected but without experimental or statistical evidence.

Schistosis

Slates are complex silicates in which quartz occurs in various amounts. The pneumoconiosis in slate workers is a silicosis and varies in incidence and severity according to the amount of free silica in the rock.

3.—CLINICAL PICTURE

The dyspnœa, chest pains, cough, haemoptysis, gastro-intestinal symptoms, and loss of strength, complications, and physical signs are discussed under the title Silicosis, which is the prototype of the pneumoconioses.

4.—DIAGNOSIS

The examination should include a family and personal history with particular note of tuberculosis and attacks of bronchitis or of pneumonia. The physique, shape of the chest, and the presence or absence of mouth-breathing are important points.

A detailed occupational history with knowledge of the dust hazard and an X-ray film are essentials.

5.—TREATMENT

(1)—Prophylaxis

Preventive measures should be taken in all industries in which there is a dust hazard. These are matters for industrial engineers and include strict discipline in the work places, the wearing of masks, wet or foam drilling and mist projectors after blasting, soiling of the roads and scene of operations, and careful selection and repeated re-examination of the workers.

(2)—Cure

Fibrosis once established is progressive, and no known treatment seems to influence the course. Protection against infections, e.g. influenza, catarrhal infections, and especially against tuberculous infection, and symptomatic treatment for the symptoms as they arise are the limits of action.

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VOLUME TEN

PITUITARY GLAND DISEASES
TO
RETINA DISEASES

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quarrying and dressing of granite, containing 10–33 per cent of crystalline quartz (Sutherland, Bryson and Keating, 1930); mining and manufacture of graphite, with up to 11 per cent of quartz as impurity (Gloyne, Marshall and Hoyle, 1949); the manufacture of building bricks (Keppler and Bumsted, 1950); and the dressing of iron and steel castings to which quartz-containing moulding sand adheres (Zanetti and Dompè, 1950) (Report on *Industrial Lung Diseases of Iron and Steel Foundry Workers*, 1950). The report contains much medical and technical information and a series of excellent reproductions of chest radiographs. *Official publication on foundries*

(2) Coalminers' pneumoconiosis—anthraco-silicosis

This disease may be regarded as the result of inhalation of a mixed dust containing a relatively small proportion of free silica. It occurs in all countries where coal is mined, and it is found also in trimmers of coal cargoes in ships. In Great Britain it accounts for more deaths than do all other forms of pneumoconiosis combined; returns by the Registrar-General for England and Wales show 322 deaths of coalminers from silicosis, out of a total of 534 from all industries, and, in addition, 317 deaths of coalminers certified as due to pneumoconiosis (Ministry of Labour and National Service, 1949b). The distribution of the disease in Great Britain shows a great preponderance in the South Wales coal-field. The results of an investigation undertaken in South Wales by the Medical Research Council are published in three reports in the *Special Report Series* "medical", in 1942 (No. 243), "environmental", in 1942 (No. 245) and "experimental", in 1945 (No. 250). Renewed research is being carried on in South Wales by the Medical Research Council's Pneumoconiosis Research Unit. Fletcher and Gough (1950) review recent work and the present position. *The most prevalent form of pneumoconiosis* *Incidence of anthraco-silicosis* *Intensive research*

Two processes are described: (a) a simple pneumoconiosis, due to deposits of coal dust in the lungs, causing a minimal fibrotic reaction in numerous dust foci, which are often surrounded by an area of focal emphysema; (b) a complicated, or infective, pneumoconiosis, in which infection, probably tuberculous, leads to the formation of areas of massive fibrosis. Radiologically, the simple form shows micro-nodular opacities over both lung fields, but less numerous at the apices. Clinically, disability is seldom severe except in older men, and progression depends on continued exposure to dust. In the complicated form, progressive massive fibrosis supervenes on the simple form; it is independent of continued exposure to dust, but seems to depend on an infective process. Radiologically, massive shadows, sometimes breaking down, are seen, usually in both lungs, with areas of emphysema; this condition often leads to severe disability and death. *Aetiology and pathogenesis* *Simple form* *Complicated form*

The incidence of coal-miners' pneumoconiosis varies widely in different mines or coal-fields, and there is some evidence that, in Great Britain at least, this is related to the "rank" of coal rather than to the proportion of free silica in the dust. *Incidence*

5. ASBESTOS AND OTHER FIBROUS SILICATE MINERALS

(1) Asbestos

Asbestosis is a more serious disease even than silicosis, but it is far less prevalent. It is caused by the inhalation of asbestos dust. Asbestos is a mineral composed of silicates of magnesium or iron. It is fibrous in form, and this fibrous structure determines many of the characteristics of the disease. *Asbestosis*

Pathology

The inhaled particles may reach up to 100 microns in length and they are caught in the bronchioles. Phagocytosis is imperfect and "asbestosis bodies" are formed. Fibrosis is diffuse, never nodular, and the bases of the lungs are chiefly affected. The lungs become tough and fibrous; emphysema, often bullous, is found at the margins and apices, and the less fibrous parts usually show congestive and inflammatory changes. Histological examination shows generalized fibrosis, thickened alveolar walls, and numerous "asbestosis bodies".

Fibrosis

Association with cancer

The association of cancer with asbestosis has suggested a causal relationship. Of 235 fatal cases of asbestosis, reported to the British Factory Department in the 23 years 1924-46, cancer was present in 31 cases; the incidence in asbestosis was 13·2 per cent compared with 1·32 per cent in silicosis (Ministry of Labour and National Service, 1949a).

Course and prognosis

Exposure to asbestos for a few years, usually during youth or adolescence, is followed by a latent period. Increasing dyspnoea supervenes, and the disease often ends fatally with pulmonary congestion after an acute infection, such as influenza. The sputum contains asbestosis bodies.

Diagnosis

Diagnosis is based on the following: (a) a history of occupational exposure to asbestos dust; (b) increasing dyspnoea; (c) physical signs of congestion, especially at the bases of the lungs; (d) radiographic appearances of diffuse ground-glass opacity, especially around the heart shadow and at the bases of the lungs (Merewether, 1933).

Treatment

Treatment is directed to protection from infection, and relief of symptoms.

(2) Talc

Talc or soapstone

A case of pneumoconiosis was described by McLaughlin, Rogers and Dunham (1949) in a man who died from rheumatic endocarditis; he had worked in a tyre factory for 37 years and was exposed to talc dust. The lungs contained straight fibres of talc; the non-fibrous particles apparently had been eliminated. Bruusgaard and Knudsen (1949) reported marked radiological changes in 9 out of 34 men employed in a talc mill in Norway for periods of from 7 to 10 years; there was less disablement than would have been expected from the x-ray appearances.

(3) Sericite and sillimanite

Other fibrous silicate minerals which have been suggested as causes of pneumoconiosis include sericite (Jones, 1933) and sillimanite, reported on by Gärtner and van Marwyck (1947).

(4) Glass-wool

Fibre-glass

Glass-wool, an artificial fibrous silicate and not a mineral, was examined experimentally by Gardner (1942), who considered that this material lacks the basic physico-chemical properties required to produce fibrosis.

6. NON-FIBROUS SILICATE MINERALS

Totally combined silica

In the absence of free silica and of fibrous structure, the dust of silicate minerals appears to produce radiographic changes associated with symptoms which are less severe than the x-ray signs suggest. The amount of change depends on the concentration of dust in the atmosphere and the duration of exposure. This was found in regard to mica by Dreessen and his co-workers (1940). A fatal case of pneumoconiosis due to fullers' earth (montmorillonite), was described by Campbell and Gloyne in 1942. Kaolin

Mica

Kaolin