CERAMIC ABSTRACTS

1955

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ertures therein and a substantial wall thickness about the apertures, the outer walls of the ferrules being provided with screw reads, the inner walls of the ferrules also being provided with rew threads separate and distinct from the screw threads on the ıter walls, the threads on the outer walls screw threadedly engging those of the sockets and the threads on the inner walls ing of the same hand as the threads on the outer walls. D.J.B.

Magnetic separator. WILLIAM E. BOX, JOHN T. CLARIDGE, ND ARTHUR G. TURNOCK (Electromagnets, Ltd.). U. S. 2,-0,263, Sept. 28, 1954.—1. A magnetic separator incorporates endless band conveyer having superposed runs, onto the upper n of which the material to be separated is directed, and magnetic ılar means located transversely between the runs at the discharge end and extending for the full width of the conveyer with ıe poles arranged transversely. D.J.B.

Method of lapping quartz crystals. FRED L. WHITE (Crane acking Co.). U. S. 2,687,603, Aug. 31, 1954.—1. The method lapping an article having oppositely facing surfaces which are ightly out of parallelism with each other to bring the faces into rallelism comprises applying the article to a plane lapping surce of a rotating lap with one of the surfaces in contact with the p and exerting pressure on the article by establishing a planar ference surface parallel to and spaced from the plane lapping rface, and maintaining a thin film of air between the reference plane and the other surface of the article to "float" the article from the reference surface and orient the first surface of the article so that its angular inclination or deviation from the plane of the reference surface is equal to the original angular inclination or deviation from the other surface D.J.B.

Operating means and action for stone crushers. NELSON H. BIGIE. U. S. 2,687,258, Aug. 24, 1954.—1. A rock crusher comprises a horizontally disposed annular support forming an open bottomed material discharge chamber, a spider within the support and including a plurality of spaced arms extending inwardly from the support and a block carried by the arms and disposed centrally of the chamber, an upper frame including a lower inwardly converging anvil portion and an upper hopper portion opening into the anvil portion, the frame being mounted on the support substantially centrally above the block, a conical crusher head slidably mounted on the block for vertical movement axially of the anvil portion, and means for reciprocating the head relative to the anvil portion to crush rock on the upstroke and discharge crushed rock down through the chamber on the downstroke. D.J.B.

Outside cloths for the filtering cloths of filter presses. J. S. HEATH AND C. R. HEATH. Brit. 709,077, March 17, 1954.—A filter cloth has a center part of open weave or of network plastic material with a bounding strip of plain or imperforated plastic material. B.C.R.A.

X—Instruments and Methods for Physical Tests

Applications of X-ray diffraction in the environmental field. . LENNOX AND J. LEROUX. *Arch. Ind. Hyg.*, Oct. (1953); re-inted with additions in *Norelco Reporter*, 1 [6] 91–97, 104 954).—L. discusses procedures that can be used for the identiation of toxic materials by means of a special camera or Geiger unter spectrometer. The methods are much more rapid than ıemical methods. Quartz, talc, asbestos, mica, beryllia, metal- oxides, organic insecticides, and the possibilities in urban air ollution are covered. Further studies regarding quantitative ethods are mentioned briefly. 6 references, 11 figures. D.J.B.

Philips 75 kv. electron microscope. ANON. *Norelco Reporter*, 1 [6] 99–104 (1954).—Technical data and a description of is new instrument are presented. 10 figures. D.J.B.

Raw material control in a wall tile plant. A. M. ILLING. *Am. eram. Soc. Bull.*, 33 [11] 338 (1954).—While the usual control sts, such as chemical analysis, screen test, particle size deterination, etc., may indicate to the producer that he is supplying iform shipments, the only means the consumer has of deterining how the raw materials will actually behave is to incorpote the material into a test body or glaze.

Study of the impact of spheres on plates. J. P. A. TILLETT, *roc. Phys. Soc.* (London), 67 [417B] 677–88 (1954).—Measureents of the coefficient of restitution and times of contact were ade for the impact of steel balls on plates of glass and plastics. he type of glass is not specified, but at 20° the coefficient of restution was found to be 0.985. When plates are thick relative the size of the ball, the coefficient varies only slightly with ıpact velocity. The time of contact varied with impact velocy, v_0, as $1/v_0^{1/5}$. Contact time for the glass with a steel ball 25 in. in diameter at 90 cm. sec.$^{-1}$ was 32×10^{-4} sec. A mathetical study was made to establish a relationship between engy loss due to internal friction during impact and the relaxation ectrum of the material. 5 figures. W.A.

Use of the dilatometer and the high-temperature microscope r characterizing kaolins and clays. HANS JOACHIM HARKORT. *eram. Z.*, 6 [7] 315–20; [8] 381–88, 409 (1954).—A wide range of erman refractory ball clays, sagger clays, and kaolins were exmined by (1) chemical analysis, (2) measuring the expansion and ntraction of rods 50 mm. long during heating to 1100°C., and) observing and photographing the shrinkage and sintering of mm. cubes during heating to 1600°C. in a furnace on the icroscope stage. The effects of the different mineral constituts of the clays on their sintering characteristics are discussed.) figures. J.A.S.

BOOK

Introduction to Optical Determinations with the Polarization ·icroscope (Anleitung zu optischen Untersuchungen mit dem olarisationsmikroskop). 2d ed. F. RINNE AND M. BEREK, evised by MAX BEREK, edited by C. H. CLAUSSEN, A. DRIBSEN, AND S. RÖSCH. E. Schweizerbart'sche Verlagsbuchhandlung (Erwin Nägele), Stuttgart, 1953. xiii + 366 pp. Price DM 29.—Twenty years have passed since M. Berek revised the well-known smaller textbook of Rinne (5th ed. in 1922) to a modern form. He has not been able to see this excellent 2d edition of his work, but the fine and respectful spirit in which the editors have finished the book speaks from every page. The great progress which was made, especially by the E. Leitz Optical Works in Wetzlar, in the last two decades in the construction of modern polarization microscopes is most evident. The methods developed by Berek for the quantitative determination of the optical constants for opaque minerals in reflected light are one example of this progress; they are particularly important for the problems of the physiography of rock-forming minerals, the investigation of ore deposits, and even for the industrial laboratory. The examination of ceramic products by microscopic-optical methods is no less essential than corresponding studies in the wide fields of metallography and chalcography. The considerable increase in the fundamental chapters on optical crystallography has been compensated by a distinct reduction in the size of the chapter on geometric crystallography. Characteristic of this book is the preferred use of mathematical formulas of the optical problems of crystallography; graphical diagrams, which are so often used in American textbooks, are generally omitted. Great emphasis is given to methods using the 4 and 5 axis universal stage, the methods of Fedorov-Nikitin-Ussov, those of Berek (pages 259–93), and the Berek microphotometer methods (pages 301–31) for the determination of the anisotropy parameters of opaque minerals (double reflection, uniradial reflection, etc.). The book concludes with methods for inclined reflection, e.g., in the use of the universal stage for the measurement of refractive indices by the immersion method, and related problems (pages 332–45). 285 figures. W. EITEL

PATENTS

Automatic instrument for determining permeability of porous dielectrics. WILLIAM M. WOODING (American Cyanamid Co.). U. S. 2,691,135, Oct. 5, 1954. D.J.B.

Interference microscope. KURT RÄNTSCH (Carl Zeiss). U. S. 2,688,899, Sept. 14, 1954. D.J.B.

Radiation temperature measurement. WILLIAM E. PHILLIPS, JR. (Leeds and Northrup Co.). U. S. 2,690,078, Sept. 28, 1954.—1. A system for measuring the temperature of a body from which radiant energy is emitted, the emissivity of the body being less than unity. D.J.B.

Scanning mechanisms for color sorting machines. EVERETT H. BICKLEY. U. S. 2,688,099, Aug. 31, 1954.—1. A scanning mechanism for color sorting machines comprises a shell containing a light source and photocell pickup. D.J.B.

Temperature control for driers, etc. ADAM E. ARMSTRONG. U. S. 2,687,851, Aug. 31, 1954.—2. In a system for controlling

ɔsed outwardly from the center thereof, the bottom member lapted to accumulate residual lubricant which drains from the bricant bore after a discharge thereof, the nozzle being rotatable unison with the mounting block whereby the rotation of the ive shaft is effective to extend the blade and concurrently spread ie lubricant from the bottom member outwardly toward the scharge apertures by centrifugal force in position to be ejected rough the apertures upon intermittent application of com-essed air and lubricant to the lubricant bore for deposit upon ie surface of the former cap and die. D.J.B.

Perforated brick. J. F. MARSHALL. Brit. 705,820, Jan. 20, 954.—A design for a lattice- or trellis-type hollow block having a ng path for heat conduction through the solid material. B.C.R.A.

Porous materials suitable for use as thermal and acoustic in-ulators and process for their manufacture. CHARLES MEURICE ND FERNAND PARENTANI (Bureau d'Etudes et Laboratoires nnexes a l'Institut Meurice Chimie S. P. R. L.). U. S. 2,691,-)8, Oct. 12, 1954.—1. An insulation material formed of a mix-ure of a porous low-density filler and a binder therefor consists of hollow spherular ash particles which have been separated from fly ash in admixture with the binder, the spherular particles having an apparent density of about 0.3 to 0.9 and the hollow spherular nature of the particles being maintained intact. D.J.B.

a

Process of producing lightweight aggregates. KAMIL B. CZARNECKI AND GEORGE A. BOLE (Ohio State University Research Foundation). U. S. 2,693,017, Nov. 2, 1954.—2. A process of producing lightweight aggregate comprises adding a crude hydrocarbon oil to dry claylike materials having more than 50% combined silica and alumina by weight, subsequently adding water to the material in the proportion of about 15 to 25 parts of water by weight to 100 parts of the raw material, forming the mixture into substantially rounded pellets, and then causing the pellets to swell by heating them in an oxidizing atmosphere from room temperature to a maximum temperature between 1000° and 1260°C. KAMIL B. CZARNECKI (Ohio State University Research Foundation). U. S. 2,693,018, Nov. 2, 1954.—After the mixture is formed into rounded pellets, the pellets are treated with a hydrocarbon oil having a relatively high vapor pressure relative to the vapor pressure of the first named hydrocarbon oil. D.J.B.

b

c

VII—Refractories

Anthology of refractories: I, Quartzites. E. BIAGIOTTI AND ., GRUNGO. *Ceramica*, 9 [9] 72–83; [10] 43–53 (1954).—Meth-ds of classification, volumetric and chemical analysis, physico-emical properties, behavior on firing, composition, and struc-ure are described for a number of German, French, Italian, and ransvaal quartzites. M.HA.

d

Behavior of foundry sand at high temperatures. P. NICOLAS. *iesserei*, 41 [13] 333–38 (1954).—Heat resistance and expansion oefficient are important properties of molding sands. The ictors influencing them, temperature, gas development, composi-on, and additions, were investigated, and the results are shown i diagrams. Most molding sands have a too high and harmful eat resistance, which can be overcome by using lean sands, limit-ig the moisture content to that corresponding to the highest reen strength, and using suitable additions; wood flour is partic-larly recommended as it reduces the heat expansion. Heat re-stance is defined as the highest pressure at a certain temperature iat a sand specimen prepared under definite conditions will stand ntil fracture. M.HA.

Ceramics for high-temperature applications. A. PECHMAN. *eram. Age*, 62 [5] 27–31, 34–35 (1953); *Ceramics*, 6 [61] 19–20, 2–27 (1954); *Pacific Coast Ceram. News*, 3 [6] 24, 30; [7] 20, 2; [8] 23; [9] 24 (1954). Cf. *Ceram. Abstr.*, 1954, April, p. 0a. R.H.B.

Corrosion of [glassmelting] tank blocks in the light of research nd plant experience. RUDOLF RASCH. *Glas-Email-Keramo-ech.*, 5 [9] 313–22 (1954).—The differences in the refractory roperties of kaolin and fire clay are explained by differences in ie lattice structures of the kaolinite and the "fire-clay mineral." he general reactivity of a refractory toward molten glass is de-rmined by the degree to which the surface exhibits an imperfect ittice. Lattice imperfections increase in number as the melting oint is reached, and erosion by the molten glass begins at these oints. A complete splitting of the lattice may be caused by echanical breaking (milling), by the entry of a disrupting cat-m, or by the disorder associated with a crystal transformation hange (α- → β-quartz or cristobalite, the decomposition of the iO_2-Al_2O_3 minerals, etc.). Although TiO_2 in small amounts has a vorable effect as a sintering agent, in larger amounts it acts as n ion which disrupts the tight SiO_4 lattice structure and ad-versely affects both the refractoriness and the resistance to erosion y glass. Similarly, the poor resistance of mullite brick to molten lass is due to the high-temperature decomposition of the kyanite ystal. The temperature gradient through the refractory wall lso has a marked effect on the extent of the corrosion by glass, nd it is pointed out that the common conception of a linear tem-erature gradient through the refractory is incorrect because the ermal conductivity of the refractory varies with the tempera-ure. 13 figures, 53 references. J.A.S.

e

Current trends in the development and uses of refractories. I. K. MITRA. *Trans. Indian Inst. Metals*, 6, T.P. 85 (1952).—I. reviews the phase-equilibrium diagrams in explaining the serv-e failure of sillimanite brick in steel-melting furnaces and the nportance of silica brick over basic brick under the same condi-ons. Brick and structure designs have been changed in the construction of all-basic roofs, affording higher operating temperatures. Super duty silica brick permits a 35° C. higher operating temperature, and its consumption is 3.01 lb./ton as against 3.04 lb./ton with ordinary silica brick. 4 references, 10 figures. B.L.M.

f

Developments in the electrolytic production of aluminum. R. THYAGARAJAN, R. S. RAMACHANDRAN, AND K. K. CHERIAN. *Trans. Indian Inst. Metals*, 6, T. P. 83, 296–319 (1952).—Zirconia brick has been used in containers for molten aluminum, but it does not meet the requirements of electrolytic reduction cells requiring high electrical conductivity. Electrolytic cells consist of an iron box lined with carbon made by tamping in a mixture of coke, pitch, and tar and subsequent baking or by cementing together prebaked carbon blocks with carbonaceous paste. 25 references, 5 figures. B.L.M.

Graphite electrodes. RODNEY N. HADER, B. W. GAMSON, AND BRUCE L. BAILEY. *Ind. Eng. Chem.*, 46 [1] 2–11 (1954).—A detailed review of the production of graphite electrodes from petroleum coke is given. The physical properties of typical synthetic graphite products are tabulated. 7 references, 11 figures. F.G.H.

g

Iron as a catalyst in the decomposition of carbon monoxide. P. P. DAS AND B. CHATTERJEE. *Trans. Indian Inst. Metals*, 6, T.P. 81, 279–84 (1952).—Catalytic activity of metallic iron in the decomposition of carbon monoxide decreases on continued heating in the gas. This is due largely to the formation of iron carbide and in some measure to the crystallization of the material. Hydrogen and nitrogen act as carbon-deposition inhibitors; thus, the disintegration of refractory materials may be minimized by heating them in hydrogen or nitrogen prior to their incorporation in the furnace. 4 references, 2 figures. B.L.M.

Manufacture and use of refractories in the South. C. A. BRASHARES. *Ind. Heating*, 21 [11] 2315–20, 2332, 2338 (1954).—B. discusses market conditions, types of refractories produced, and raw materials found and compares their properties with those of the East and West. Fields where refractories are most in demand are given. M.HA.

h

Mineral insulation and heat-protective materials. H. J. KARMAUS. *Sprechsaal*, 83 [11] 216–19 (1950).—K. describes 14 German patents on materials and techniques developed during the late war years (1943–1945) utilizing asbestos, slag wool, hydrogels from sodium silicate, expanded vermiculite, resin soap, sulfite lye, bitumen emulsion, and other agents. L.E.S.

i

Oxidation of silicon carbide and a protective coating. H. W. FAUST AND G. STIRN. *Glas-Email-Keramo-Tech.*, 5 [9] 323–24 (1954).—The advantages of the excellent thermal and refractory properties of SiC are limited in furnace practice by the physical deterioration caused by oxidation of the SiC. Almost complete protection is given by a surface coating of Vanal. Cf. *Ceram. Abstr.*, 1954, Feb., p. 29*f*. J.A.S.

j

Raw materials for the refractories industry: I, Quartzite. BHOLANATH CHATTERJEE. *Indian Ceramics*, 1 [2] 53–56 (1954).—Quartzite or silica stone required for the manufacture of silica brick comes from Ratanpur and Purabsarai in Monghyr district and Behar-sarif in the Patna district of Bihar. Detailed prospect-

tative precipitation of uranium values and a minimum coprecipitation of vanadium values from a leach liquor obtained by extracting a carnotite ore with an aqueous solution of sodium carbonate comprises heating the leach liquor to 194°F., adding sulfuric acid thereto until an immediate pH value of 6.0 to 7.1 is attained, holding the reaction mixture at 194°F. for about 2 to 4 hr., and then separating the uranium containing precipitate from the supernatant liquor. D.J.B.

XIV—General and Historical

Bulk transportation by rail. JOHN M. GLEASON. *Am. Ceram. Soc. Bull.*, 34 [3] 72–73 (1955).—G. describes a new type of special hopper car for the efficient and economical shipment of dry powdered and granular materials. Where materials are now being shipped in paper sacks, conversion to bulk shipment in the new cars would effect substantial savings. 1 figure.

Color in factories. C. STURMER. *Glas-Email-Keramo-Tech.*, 5 [12] 443–44 (1954).—A brief review is given of the psychological value of color, particularly of pastel shades, for both workrooms and machines. In choosing the colors, the effect of artificial light must not be overlooked. It is recommended that moving parts of machines and hazardous sites in the workroom be painted yellow, and that the traditional bright red be retained for fire hazards. The use of colors to identify supply lines should be restricted to terminations (taps, valves), junctions, and patches spaced along the straight runs. J.A.S.

Good design makes sense and dollars too. HOWARD BOURNER. *Ceram. Ind.*, 63 [2] 80–81 (1954).—Design in packaging is discussed. 6 figures. T.H.E.

How, when, and where to use ceramics. J. H. KOENIG AND E. J. SMOKE. *Ceram. Age*, 63 [6] 25–27 (1954).—The merits of ceramic products are briefly described. Structural clayware, enameled metals, refractories, chemical porcelain, electrical porcelain, ferrites, titanates, etc., are covered. R.H.B.

Perfect packing pays. HENRY BOLLMAN. *Ceram. Ind.*, 62 [5] 65 (1954).—Packing of pottery for shipment is discussed. T.H.E.

Which dusts in the ceramic and glass industries are a danger to health? K. G. SCHMIDT. *Ber. deut. keram. Ges.*, 31 [11] 355–63 (1954).—Silicosis, its pathology, the factors contributing to its incidence, and the technique of atmospheric dust counting are reviewed. Disagreeable nasal and bronchial complaints are caused by the inhalation of SiO_2 particles $>5\mu$, but these particles are too large to enter the alveoles of the lung and therefore do not cause silicosis. The harmful particles are $<5\mu$, but a large proportion of the very finest particles are expelled again with the breath. Tridymite and cristobalite are even more dangerous than quartz (firebrick dust is therefore very harmful). Vitreous SiO_2 is harmless or almost so, and the silicate glasses are quite harmless. A mixture of coal and quartz dusts (around coal-fired kilns?) is particularly harmful; the addition of feldspar, mica, or kaolin diminishes the effect of quartz dust, but it is uncertain whether mica dust alone is harmless. Clays are harmful according to their free quartz content. Mixed dusts of quartz and fluorspar (in enamel plants) are particularly harmful. Pure corundum and silicon carbide are harmless, but asbestos and talc may cause nonsilicotic fibrosis. Among other harmless dusts are olivine, augite, hornblende, gypsum, chalk, and Fe; the latter gives shadows in the X-ray picture of the lung which may be mistaken for silicosis. Mention is also made of the health hazards occasioned by elements or compounds of Pb, As, Cr, Cd, Hg, S (in some mines), Mn, Zn, and Be. 11 figures. 39 references. J.A.S.

Widening horizons for porcelain enamel in home products. C. A. HUTT. *Ceram. Age*, 63 [6] 27, 29, 30, 33 (1954).—The economic and social factors responsible for the growth of enameled products are discussed. R.H.B.

SEPARATE PUBLICATION

Graduate Theses Accepted by Virginia Polytechnic Institute, 1951–1954. *Bull. Virginia Polytech. Inst.*, 47 [10] 22 pp. (Aug. 1954).—Thesis titles of the School of Ceramic Engineering are as follows: "Time as a factor in the dissociation of calcium sulfate," by William B. Harrison; "Critical study of high temperature load testing of small-scale refractory shapes," by Dunbar J. Baker; "Further study of small-scale firebrick samples under load at high temperatures," by Ronald H. Lester; and "Approach to equilibrium of mixtures of CaO, Al_2O_3, and SiO_2 heated to various temperatures," by Sylvester A. Vitolo.

PATENTS

Alkali phosphate production. HENRY S. WINNICKI AND CHARLES P. ROBERTS (Food Machinery & Chemical Corp.). U. S. 2,708,619, May 17, 1955.—1. The method of producing alkali metal phosphates comprises burning phosphorus in a downwardly directed flame in the top of an elongated, vertical, thin-walled, unlined, stationary, steel reaction chamber which is corrosion resistant to alkali solutions up to 100°C. to produce phosphorus pentoxide, flowing an aqueous alkali solution initially containing a compound selected from the group consisting of sodium, potassium, and ammonium carbonates and hydroxides downwardly along the inside walls of the reaction chamber in concurrent flow with the downwardly directed flame, covering the walls of the reaction chamber from top to bottom thereof with the solution, reacting the phosphorus pentoxide with the solution flowing downwardly along the walls of the reaction chamber to produce an alkali phosphate solution, maintaining the walls of the reaction chamber between 80° and 100°C. by evaporating water from the solution within the chamber, removing the solution from the chamber, and crystallizing and dehydrating the reaction product to produce a solid alkali phosphate mass. D.J.B.

Alumina production. JACQUES B. HOUSTON AND HERTIS V. MCGILL (Kaiser Aluminum & Chemical Corp.). U. S. 2,707,669, May 3, 1955.—2. A process for the production of coarse-grained alumina hydrate having at least 70% by weight of particles plus 200 mesh comprises precipitating alumina hydrate from a portion of fresh supersaturated aluminate liquor in the presence of coarse particles of previously precipitated and classified hydrate from an initially treated portion of fresh liquor as seed and in the substantial absence of precipitated fine hydrate, the amount of the coarse hydrate added as seed being such that the alumina-to-caustic weight ratio of the liquor attained at the end of a selected precipitation time is in excess of about 0.350 and up to about 0.400, maintaining the coarse particles in suspension in the mixture by agitation to promote precipitation and further growth of the coarse seed particles, classifying the hydrate particles produced by discontinuing agitation of the slurry and permitting the coarse and fine hydrate particles to stratify by settling, separating a slurry of enlarged coarser particles from the relatively fine hydrate particles by transfer of the former to a quiescent zone for further settling, further separating and removing additional fine hydrate as overflow in the quiescent settling zone, and recovering a concentrated slurry of enlarged coarser particles. D.J.B.

Chromatographic adsorption apparatus with eluting solvent flow control valve. LEO J. NOVAK (Commonwealth Engineering Co. of Ohio). U. S. 2,708,519, May 17, 1955.—1. In a system for chromatographic separation of materials, the apparatus comprises a pair of close-fitting hollow bodies rotatable one within the other, each body having openings selectively registrable with openings of the other body to define paths through the bodies normal to the axis of rotation, an adsorbent for a solute filling the inner body, and means to pass an eluting solvent for the solute through a selected path of the bodies and means for passing material to be separated by adsorption axially of the apparatus. D.J.B.

Purification of ammonium beryllium fluoride solutions. CARL W. SCHWENZFEIER, JR. (United States of America as represented by the United States Atomic Energy Commission). U. S. 2,708,618, May 17, 1955.—1. A process of substantially diminishing the amount of chromium impurities contained in an ammonium beryllium fluoride solution comprises adding PbO_2 thereto, boiling the resulting slurry, and then removing the precipitate therefrom. D.J.B.

XIV—General and Historical

Bow china factory and Edward Heylyn. G. WILLS. *Connoisseur*, 133, 100–102 (1954).—W. gives all the available information about Edward Heylyn, to whom a patent was granted on Dec. 6, 1744, for the use of bone ash in porcelain manufacture, and on his connection with the Bow chinaworks. 4 figures. W.A.

Financial developments in the [British] ceramics industry. M. DUFFY. *Ceramics*, 7 [74] 66–68 (1955).—The growth of eleven well-known ceramic firms is reviewed. A.B.S.

Research projects completed or in progress since May 1954. ANON. *News in Eng. at Ohio State Univ.*, 27 [2] 25 (1955).—Fifteen ceramic projects are listed with title, purpose, and staff for each. R.W.C.

Scottish pottery. W. C. WALLIS. *Pottery Quart.*, 2 [5] 7–12 (1955).—W. gives a brief historical description of potteries in Scotland and discusses several living potters. The most highly decorative ware was made in 1820 to 1845. 2 photos. A.B.S.

Terminology of limestone and related rocks—interim report. JOHN RODGERS. *J. Sediment. Petrol.*, 24 [4] 225–34 (1954).—The results of a questionnaire on the terminology of limestone and related rocks indicate where usage is reasonably uniform and where it is sharply divided. From majority usage it is possible to prepare tentative definitions for the following compositional and structural terms: carbonate rock, calcareous (adjective) limestone, dolomite (the rock) or dolostone, dolomitic limestone, calcitic dolomite or dolostone, marl, marlstone, oölite, ooid, coquina, coquinite, and coquinoid (adjective). Usage on terms expressing grain size and on terms expressing genesis is not yet uniform enough to warrant proposing formal definitions, but further debate on these matters should be fruitful, if focused on the distinctions that need to be made among the rocks themselves. S.A.F.

Toxicity of ceramic raw and accessory materials. H. STRAUSS. *Euro-Ceram.*, 5 [4] 84–87 (1955).—The harmfulness of some raw materials, solid chemicals, and acids, which are inhaled as dust or which come in contact with the skin, is described. Symptoms and antidotes are given, particularly for hydrofluoric, nitric, and sulfuric acids. Of the metals, special care must be taken in handling Mn, Cr, Co, and Pb. M.HA.

BOOKS

Chemical Engineering Materials. F. RUMFORD. Constable & Co., Ltd., London. 1954. ix + 380 pp., illus.—R. reviews the properties and limitations of the materials available for chemical plant construction, including brick, tile, stoneware, refractories, insulating compounds, vitreous silica, and hard glass. V.R.E.

Directory of the Ceramic Industry, 1954/1955 (Adressbuch der Keram-Industrie). 23d ed. 1955. Published by Verlag des Sprechsaal, Müller & Schmidt, Coburg, Germany. Price DM 25 plus postage.—This edition gives a complete list of factories and plants manufacturing porcelain, steatite, earthenware, faience, tile, furnaces, refractories, grinding and polishing materials, and machinery in the German Federal Republic, Saar District, Austria, Belgium, Denmark, Finland, France, Greece, Great Britain, Ireland, Israel, Italy, Yugoslavia, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland, and Spain. Each section is arranged so that any product wanted in any country can easily be found. The trademarks of all the companies listed are shown on 109 pages. A list of vocational schools and research institutes and the accident insurance laws are included. Indexes in English and French. M.HA.

To obtain a satisfactory concentration of energy it is necessary to use a high number of plane elements, and it is difficult to keep them exactly in position. According to this invention, the elementary mirrors are each constituted by an elastically deformable plate subjected to the action of mechanical deforming means adjusted to give it, at least approximately, the shape of the corresponding portion of the theoretical surface of the mirror, the mechanical deforming means being capable of giving to every elementary mirror the nonsymmetrical shape of a small portion of a large mirror, even if this large mirror is itself a body of revolution about an axis, e.g., a paraboloid of revolution. By this construction, it is possible to constitute a composite mirror having a number of elementary mirror plates equal to only $^1/_{15}$ or $^1/_{15}$ the number of mirrors necessary when the elements are constituted by plane mirrors. H.E.S.

High temperature kiln with oxidizing or neutral firing atmosphere. Compagnie Générale de Télégraphie sans Fil. Fr. 1,081,173, June 9, 1954.—A kiln for temperatures of 1400° to 1800°C and higher is characterized by the use of tungsten heating elements individually surrounded by a refractory sheath in a reducing atmosphere forming an enclosure permitting the immersion of the heating element in a neutral or reducing gas while the atmosphere of the furnace, outside of the refractory sheath, is neutral or oxidizing. S.F.C. & M.Ha.

Improvements in the saggers of porcelain kilns. Société des Electrodes et Réfractaires Savoie. Fr. 1,081,230, June 9, 1954.—Around the central opening and, in the case of a perforated sagger, the length of the outer circumference of the sagger is a flange sufficiently high to retain the particles of refractory material on the sagger. S.F.C. & M.Ha.

XII—Raw Materials

Aerial photography, vegetation, and geology. D. R. Grantham. *Mining Mag.*, 88 [6] 329–37 (1953).—G. gives examples in which vegetation types, density, and animal habitations, such as ant and termite hills, aid in determining the occurrence of soil and rock types and geologic structure from aerial photographs. 5 figures. M.D.T.

Asbestos. W. A. Rukeyser. *Eng. Mining J.*, 156 [2] 110–13 (1955).—An annual review and forecast of asbestos production and developments. M.D.T.

Asbestos in Southern Rhodesia. W. E. Sinclair. *Mining Mag.*, 87 [3] 145–51 (1952).—Many commercially valuable ore bodies lie in the discontinuous serpentines that extend generally in a north-south direction through the center of the country. Long-fiber chrysotile is a major item in the over-all production, which has increased from less than 500 tons in 1914 to 77,663 tons in 1951. 1 reference, 6 illustrations. M.D.T.

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Measuring the crushing resistance of rocks and ores. Ben-