CERAMIC ABSTRACTS

Compiled by

The American Ceramic Society

1946

by each branch. During 1944 scientific investigations were undertaken in two principal directions: (1) the development of theoretical and practical methods of physical and chemical analysis of new alloys, the processing of complex multimetal ores, and the study of domestic mineral resources; and (2) investigations relative to the basic chemistry of complex compounds and the development of effective methods for the recovery of rare metals and their alloys. Of special interest to the ceramic industry are the studies undertaken by the Laboratory for Silicates and its reports on the chemical stability of glass and the diffusion of gases in molten glass. A.J.S.

Séailles-Dyckerhoff Alumina Process. Portlandzement Fabrik Dyckerhoff & Söhne at Amoneburg bei Biebrich. F. M. Lea. *BIOS Final Rept.*, 187, Item 22; PB 18,938, 7 pp. (Aug. 1945); abstracted in *Bibliog. Sci. Ind. Repts.*, 1 [22] 1341 (1946). Price photostat $1.00, microfilm 50¢.—This is a report of the process for extracting alumina from coal ashes, based on a discussion with personnel of the Dyckerhoff works and examination of some analytical records. Essentially, the process consists in burning an alumina-containing raw material with limestone; extracting the pulverized material with water by a countercurrent method; precipitating the alumina and lime from this solution by treatment with carbon dioxide, and then subsequently extracting the alumina from the mix of these two solids by treatment with soda. Initially, in the pilot-plant trials, the Séailles water extraction method was used, but it was later abandoned in favor of the alkali extraction method. Details of the process, analysis of the materials, and economic considerations are discussed. The residue from the alkali extraction process proved quite satisfactory for use in Portland cement manufacture.

Synthesis of Fluorine-Micas of the Phlogopite Group; Crystallochemical and Microscopic Investigations of Synthetic Phlogopites; Regular Intergrowth of Synthetic Phlogopite with Hydrous Micas. W. Eitel. *FIAT Final Repts.*, 747, 748, and 749; PB 20,530, 41 pp.; PB 20,531, 32 pp.; PB 20,532, 34 pp. (March 1946); abstracted in *Bibliog. Sci. Ind. Repts.*, 1 [18] 984 (1946). Price (each) photostat $3.00, microfilm 50¢.—This is a series of three reports on synthetic mica research by Eitel and his coworkers at the Kaiser Wilhelm Institute for Silicate Research at Berlin-Dahlem and Ostheim Rhoen, Germany. A process for the production of synthetic mica on a laboratory scale was developed. In PB 20,530, practical details involved in the synthesis are set forth. Potash-magnesia micas and barium micas were made in small crucibles. To produce well-oriented crystals, particular importance was placed on well-regulated temperature gradient in a vertical direction during the first of the cooling period and a magnetic field surrounding the crucible in a horizontal direction. In PB 20,531, the basic crystallographic theories are discussed with complete descriptions of the results of various melts in the phlogopite series. PB 20,532 gives the results of crystallographic studies of synthetic phlogopite, and the rules governing intergrowth of phlogopite and humite crystals are derived. Tables, diagrams, and explanatory photomicrographs.

Synthetic Sapphire and Spinel Production in Germany. M. H. Barnes. *FIAT Final Rept.*, 855; PB 17,345, 17 pp. (1945); abstracted in *Bibliog. Sci. Ind. Repts.*, 1 [20] 1204 (1946). Price photostat $2.00, microfilm 50¢.—Two plants in Germany produced synthetic sapphire and spinel boules during the war, the I. G. Farben plant at Bitterfeld and the Wiedes Karbid Werke at Freyung. Both plants employ the basic Verneuil process, the principles of which are known in the U. S. The details of German apparatus and process are revealed here for the first time. A process for hardening spinel bearings so that their performance approached that of sapphire and so that only one fourth as much diamond was needed for fabrication was developed.

Temperature Interconversion Tables and Melting Points of the Chemical Elements. *Nat. Bur. Standards Misc. Pub.*, M183, April 10, 1947 (supersedes *Misc. Pub.* M126). Price 5¢ from Supt. of Documents, Washington 25, D. C. S.M.L.

X-Rays in Practice. W. T. Sproull. McGraw-Hill Book Co., Inc., New York, 1946. 615 pp. Price $4.00. Reviewed in *Mech. Eng.*, 69 [2] 165 (1947). F.G.H.

See the following additional abstracts

Sect. XII: Colloid chemistry of the clay mineral attapulgite.

XIV—General

Central Glass and Ceramic Research Institute. Anon. *Jour. Sci. Ind. Research* (India), 4 [7] 387–88 (1946).—The foundation of this Institute in Calcutta is the first of the five national laboratories to be established in India. Cf. *Ceram. Abs.*, 1947, July, p. 151g. M.Ha.

Employing an engineer—hiring practices analyzed. Joint Economic Status Committee. *Amer. Engr.*, 17 [4] 2, 12–13 (1947).—A preliminary report is given of a survey being made to answer questions which both the employer and the prospective engineering employee ask. The survey includes the type of engineers hired, how young engineers are recruited, how experienced engineers for specific openings are obtained, the most important factors taken into consideration in hiring an engineer, and how much newly employed engineers are paid. The median answer for the last question was found to be $207 per month in a range of approximately $175 to $250, however, the salary depends on the individual in 30% of the industries and upon prevailing wages or special factors in the other 80% of the industries polled. The glass industry was included in the list of those paying the highest wages for recent graduates. In general, the answers to other questions were based on too little data to be conclusive as yet; some trends, however, were indicated. L.R.M.

General business conditions. Anon. *National City Bank Monthly Letter* (June 1947).—The opinion that the peak of the postwar boom has been seen is now fairly general. Where recession has occurred, however, it is still of little weight, so far as the aggregates of production, income, or employment are concerned. The most significant changes that have occurred are in the price trend of basic commodities, the filling up of shortages of more and more consumers' goods, and buyers' resistance to out-of-line prices, including construction. The going will be harder for new or rapidly expanded concerns than it was during the war and the postwar boom. It will be harder for everyone who cannot meet competitive costs. The test of the situation in the coming months will be the state of employment and the output of goods and services to promote the general welfare. R.H.B.

Histology of asbestosis. L. Nuro. *Acta Path. Microbiol. Scand.*, 23 [1] 33–58 (1946); abstracted in *Jour. Amer. Med. Assoc.*, 133 [9] 652 (1947). D.C.P.

How to tell your story to workers. Anon. *Modern Ind.*, 13 [5] 44–48 (1947).—The widening gulf between labor and management shows the need for better understanding. That gulf has led to Communism in some countries and to Socialism in others. Thus far it has led only to crippling strikes and generally reduced worker productivity in this country. Communications from management to workers, the smooth flow of information, facts, instructions, and educational material, is today's No. 1 industrial-relations problem. Methods of shaping employee opinion include the following mediums: (1) Supervisory word-of-mouth, (2) bulletin boards, (3) pay-envelope inserts, (4) news letters, (5) employee publications, (6) employee meetings, (7) public-address systems, (8) plant-city advertisements (9) radio, (10) employee handbook, (11) annual statement (12) labor-management activities, and (13) movies. R.H.B.

Influence of age on silicosis. E. Martin and L. Roche *Presse méd.*, 54 [Jan. 5] 3 (1946); abstracted in *Jour. Ind Hyg. Toxicol.*, 28 [6] 137–38 (1946). D.C.P.

Lamps and the spectrum. C. E. White. *Ohio State*

melting SiO_2 and TiO_2 together, glasses with an even lower expansion coefficient than that of silicate glass are obtained:

SiO_2	94.7	93.8	91.6	90.3	89.6
TiO_2	5.3	6.2	8.4	9.7	10.4
$\alpha \times 10^{-7}$	2.1	1.75	0.1	0.7	0.6

If, however, Al_2O_3 is melted with SiO_2, the expansion coefficient of the latter remains practically unchanged. An explanation for these facts is attempted on the basis of the SiO_2 structure as consisting of Si^{4+} ions and O^{2-} ions which are replaced by Ti^{4+} and Al^{3+} ions and thus cause a tighter bond or loosen up the structure and lower or increase the expansion coefficient. An application of this explanation is extended tentatively to other glasses with foreign oxide admixtures to SiO_2 or B_2O_3. See "Relation . . .," *Ceram. Abs.*, 21 [7] 141 (1942). M.HA.

Fiberglas health hazard investigation. WALTER J. SCHEELE. *Ind. Med.*, 11, 6–9 (1942); *Chem. Abs.*, 36, 4298 (1942).—There is no silicosis, fibrosis, or dust hazard involved in working with Fiberglas. The manufacture, fabrication, and application of Fiberglas products are attended by no unusual occupational hazards.

Fine-fractionating column constructed entirely of glass and employing multichamber tubes. K. KLEIN, H. STAGE, AND G. H. SCHULTZE. *Z. Physik. Chem.*, A189, 163–70 (1941); *Chem. Abs.*, 36, 5676 (1942).—Recent types of fractionating columns are discussed, and a new column employing four-chamber tubes having an efficiency equivalent to ten theoretical plates over a height of 62 cm. is described.

Formation of bubbles in Fourcault canals. G. YU. ZHUKOVSKII AND V. V. POLIVAE. *Steklo'naya Prom.*, 1940, No. 2, 12–16; *Khim. Referat. Zhur.*, 1940, No. 7, 80; *Chem. Abs.*, 36, 5623 (1942).—In 222 samples of glass taken from nine machines, SO_2, CO_2, O_2, CO and N were determined. Air bubbles predominated in the samples investigated. The source of these bubbles was the refractory material of the Fourcault canal and boat. Denser refractories do not cause the formation of bubbles. Bubbles containing SO_2 and CO_2 were formed as the result of secondary decomposition of the residue, carbonates and sulfates, from the second heating of the glass batch. The number of bubbles in the glass mass can be decreased by changing the heating régime and the construction of the Fourcault canal so that no second heating of the glass batch is necessary. See *Ceram. Abs.*, 19 [3] 63 (1940).

Glass composition and density changes. ROBERT M. ELLIOTT. *Jour. Amer. Ceram. Soc.*, 28 [11] 303–305 (1945).—2 references.

Glass densities by settling method—water-bath apparatus for production control in glass plants. MELLEN A. KNIGHT. *Jour. Amer. Ceram. Soc.*, 28 [11] 297–302 (1945). —2 references, 2 figures.

Glass, sulfuric acid, and hydrochloric acid from sodium chloride, silica, and gypsum. N. K. DERGEV. *Zhur. Prikład. Khim.*, 14, 703–705 (1941); *Chem. Abs.*, 36, 3329 (1942).—D. gives the results of preliminary work on the substitution of NaCl in the place of calcined soda for glass manufacture. Fusion of NaCl, SiO_2, and $CaSO_4$ leads essentially to Na_2SiO_3, $CaSiO_3$, and SO_2Cl_2, with side reactions yielding SO_3; in the presence of water there is also formation of H_2SO_4 and HCl; the presence of H_2O and carbon causes formation of H_2S; the presence of Fe yields some $FeCl_3$. A mixture of NaCl, SiO_2, and $CaSO_4$, when heated, goes through these stages: (1) under 100° H_2O is evaporated; (2) at about 800° NaCl-$CaSO_4$ eutectic is fused, and $CaSO_4$ reacts with SiO_2, yielding $CaSiO_3$ and SO_3; (3) at about 1100° the main reaction occurs, and any $FeCl_3$ formed is volatilized; (4) at 1300° to 1400° the mixture fuses into glass, free of bubbles and specks. In the course of glassmaking by this process 25 to 30% of the Fe content of the charge is volatilized; thus it is feasible to use low-grade silica for manufacture. During fusion there is some volatilization of NaCl, the amount depending upon the kind of siliceous raw material used. $CaSO_4$ is decomposed almost completely, leaving only 0.4 to 0.8% SO_3 in the product. HCl and H_2SO_4 are condensable and may be utilized as by-products of the operation.

Jewels of victory. L. J. SULLIVAN. *Amer. Gas Assn. Monthly*, 27 [10] 441–43 (1945).—S. discusses the use of gas in the Bausch & Lomb plant at Rochester, which produced all the optical glass necessary for its own war production and provided for the needs of other manufacturers as well. Since Pearl Harbor 4,500,000 lb. of optical glass and 100 million molded lens blanks have been produced. This plant is the largest consumer of manufactured gas in the world. During the past three years its annual consumption has averaged 821 million cubic feet. 1 diagram, 3 photographs. M.R.

Optical glass and the motion picture. R. E. BASTICK. *Jour. Brit. Kinemat. Soc.*, 4, 91–103 (1941); *Chem. Abs.*, 36, 3919 (1942).—B. deals with all phases of the manufacture of optical glass under the following headings: problems of lens design, requirements of optical glass, n and dispersion, range of optical properties, constituents of glass, devitrification, contamination by pot material, homogeneity and consistency, manufacture of pots, melting process, polishing for inspection, annealing process, and manufacture of filters.

Preparation of copper-ruby for lenses with metallic tin. I. P. NIKOL'SKII. *Steklo'naya Prom.*, 1939, No. 12, 22; *Chem. Zentr.*, 1940, II, 1341; *Chem. Abs.*, 36, 4682 (1942).—The following are mixed: Na_2CO_3 22,600, K_2CO_3 9650, chalk 4400, sand 73,000, CuO 18, Cu_2O 118, Sn 550, $C_4H_4O_6$ 82, and $NaNO_3$ 1150 gm. The coloring substances are mixed and added to the charge, and the batch is fused in a neutral atmosphere. See "Ammonium . . ." *Ceram. Abs.*, 22 [7] 115 (1943).

Production of copper ruby glass. R. CHARAN. *Science and Culture*, 7, 399–402 (1942); *Chem. Abs.*, 36, 4983 (1942).—Cu_2O and metallic Cu were studied as coloring agents. Simple soda-lime-silica batches which had low softening point and relatively low viscosity were used; various reducing agents and promoters were incorporated. The best results were obtained with 0.11 to 0.14 part Cu_2O and 1.2 to 1.5 parts stannous oxide. Maintenance of a slightly reducing atmosphere in the pot aided development of the ruby color.

Relation between linear speed of crystallization and viscosity for Na_2O-SiO_2 glasses. A. A. LEONT'EVA. *Acta Physicochim. U.R.S.S.*, 14, 245–50 (1941); *Chem. Abs.*, 36, 3078 (1942).—The linear crystallization velocity (r) for eight batches with SiO_2 content ranging from 50 to 80% was measured at a series of temperatures. Values of the constants in the relation $r = (k_1 m + k_2 \log \eta$ are tabulated. The second term is of minor importance in every case, and for glasses with 79.5, 74.0, and 65.1% SiO_2 $k_2 = 0$, i.e., $r \propto$ fluidity. See "Speed . . ." *Ceram. Abs.*, 20 [5] 114 (1941).

Research and progress in the optical glass industry. BERNARD LOWE. *Rev. optique*, 21 [10–12] 193–206 (1942); abstracted in *Z. Instrumentenk.*, 64 [4/6] 132–33 (1944).—To reduce the corrosion of melting pots by liquid melts several means have been used: (1) adaptation of the composition of the pot material (SiO_2:Al_2O_3) to the type of glass (about 25% Al_2O_3 content in borosilicate and ordinary crown glasses and high Al_2O_3 content in lead and baryta glasses); pots of sillimanite (mullite) for glasses with very high baryta content; and (2) lining of the pot with an Al_2O_3-rich special porcelain which is very dense after firing, for very heavy baryta glasses of light coloring (by iron oxides). The transparency of glasses is improved especially by reduction of the iron oxide content, porcelain lining, removal of iron by chemical means, and removal of the iron from the sand (tedious, expensive, and unreliable). Spot sensitivity of highly refractive glasses can be reduced by replacing a certain percentage of SiO_2 by TiO_2 up to 10% total TiO_2 content. Higher TiO_2 contents may cause brown coloration. Refractive index is increased and dispersion is reduced by TiO_2. Experiments to stabilize the optical properties of the glasses showed that, in cooling, two effects occur simultaneously: a mass or volume effect producing "interior stresses," and a molecular effect due to equilibrium conditions dependent on temperature. The

The following extract is from "Researches of Mellon Institute 1940-41"[1]:

"L. U. GARDNER, Director, Saranac Laboratory, has reported on the researches which the Foundation supports at his institution, saying in part. . . . 'We have been studying the effect of inhaled glass wool. Apparently even the finest textile glass set up as an atmospheric dust is not inhaled in appreciable concentrations and does not produce any dangerous effects upon the lung.'"

A further report on DR. GARDNER'S work appears in the Annual Report of the Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation for the Year 1940. The following statement is made on page 11 of the report:

"The apparent lack of pulmonary damage from exposure to glass wool dust is being demonstrated by an inhalation experiment. For over a year animals have now been exposed to as high a concentration of this material as could be maintained, with no serious effect upon their lungs. The dust has been produced by breaking into short lengths the finest textile glass that is made but none of the fibers that are floating in the air can be found in the lungs of the exposed animals. Their tendency, unlike that of asbestos, to form felt-like masses upon any object with which they come in contact, probably prevents their inhalation. Slight amounts of chronic inflammation similar to those observed with other harmless dusts, have resulted from accumulated particulate debris. These very fine, non-fibrous particles are the by-product of the violent beating used to break up the material."

X-ray Plates of Employees

THE author examined several hundred stereoscopic x-ray plates of the chests of employees of Owens-Corning Fiberglas Corporation. These were selected at random by the author from the files of some 1500 plates taken since the company, in 1939, instituted the policy of making x-ray plates of the chests of all Newark employees. Among the plates selected for special inspection were those of employees working in the batch house where the raw materials for Fiberglas are handled, and the plates of employees with records of silicosis.

Beginning in May, 1939, serial stereoscopic chest films were made of the 15 men who are now working, or who have worked, in the batch house. A repeat examination of all of the men was made in June, 1941. In no case was there any radiographic evidence of pulmonary disease.

Three cases of silicosis were discovered by the company. None of these men had ever been employed in the batch house, but their employment does require the handling of Fiberglas products. It is the policy of the company neither to refuse employment to, nor discharge, any man for whom safe employment can be found. The following covers the occupational histories of these three workers:

1. CASE No. 1 worked for another company as a molder from 1924 to 1929, and roentgenograms of the chest were made in 1929 because of the presence of tuberculosis in his family. Chest plates were again made in 1936 because of suspicion of silicosis. He was first employed by Owens-Corning Fiberglas Corporation on June 6, 1940.

2. CASE No. 2 was employed as a bottle blower and machine operator from 1901 to 1930. He was first employed by Owens-Corning Fiberglas Corporation on March 26, 1941. Silicosis was diagnosed following an x-ray examination of the chest made on May 12, 1941.

3. CASE No. 3 worked for 12 years as a molder before entering the employ of Owens-Corning Fiberglas Corporation on October 25, 1939. Silicosis was diagnosed following an x-ray examination of the chest on November 1, 1940.

In each of these silicosis cases there is a sufficient causative factor in the man's previous employment history or other circumstances, and the evidence is entirely inadequate to indicate that the condition of any one of these three men should be attributed to any silicosis hazard encountered in handling Fiberglas, even assuming such a hazard to exist.

Physicians Give Fiberglas Clean Bill

EXAMINATION of the records of disability and absenteeism in the office of the plant physician of the Owens-Corning Newark plant reveals that there is no unusual incidence of respiratory infections among Owens-Corning employees. Statements furnished directly to the author by Newark physicians whose practices are limited to eye, ear, nose and throat diseases, and who are in no way affiliated or associated with the company, indicate that these specialists notice no unusual incidence of respiratory disturbances among their private patients employed by the company, as compared with their private patients who are not employees.

The following letter, dated June 17, 1941, written to the author by JOHN E. HENDRICKS, M.D., of Newark, is typical of letters received from Newark eye, ear, nose and throat specialists:

> "I am one of five E.N.T. [ear, nose and throat] specialists located in this city. I have practiced my specialty in Newark for three years following a four-year residency in an Eastern hospital. During these three years I have treated my share of Owens-Corning employees. I can safely say that I have noticed no unusual preponderance of head or throat infections among these people as compared to my other patients who are not employed there.
>
> "If I ever make a table showing percentages of different diseases that I have treated, I feel sure that there would be only a normal proportion of Owens-Corning employees in each classification."

On the basis of the evidence, the author finds that workers handling Fiberglas products are subjected to no special occupational hazards that manifest themselves in eye, ear, nose or throat disorders, pulmonary disorders, diseases of the upper or lower respiratory system, or diseases of the gastro-intestinal tract.

Temporary Skin Irritation

NEW employees of Owens-Corning Fiberglas Corporation engaged in handling Fiberglas products occasionally suffer a mechanical irritation of the skin for a few days at the start of the job. Except for extremely rare cases of workers who may be allergic to an ingredient of binders or lubricants used in processing glass fibers, the irritation disappears within a few days. The new workers apparently become immunized against the action of the fibers, and they suffer no further discomfort.

The company recommends that workers wear clothing loose at the neck and wrists, and that they use plenty of warm water and soap when the day's work is done. Soap and water has proved most effective in removing particles of fibers, whether of glass or any other material, from the skin. The company has found that there is seldom, if ever, need of gloves, armlets or other protective clothing. In the absence of gloves or similar protective clothing there is less tendency for fiber particles to be rubbed into the skin.

---

1. Appearing in *News Edition*, American Chemical Society, Vol. XIX, page 661, April 10, 1941.

Two Hundred Employees Examined

ON June 3, 1941, the author made an examination of the wrists, arms, ankles, necks, eyes, shoulders and waists of approximately 200 production employees engaged in handling Fiberglas products in Owens-Corning's Newark plant. These workers were employed on production lines and at fabricating operations, cutting, sawing, shaping, transporting and packaging glass thermal insulating wool, both bonded and unbonded.

The author did not see a single case of eye irritation or conjunctivitis during this inspection. Only one worker who had begun to work in the plant four days before on a fabricating job showed evidence of significant skin irritation. One 22-year-old employee who told the author he had worked in the plant for two and a half years said that, although he had become accustomed to handling Fiberglas and suffered no discomfort while continually on the job, he had noticed a mild skin irritation that lasted a few days after returning to the job following his two-week vacation.

"As long as I am working right along," he told the author, "I stay toughened up to it. But if I haven't been handling it for a while, like when I'm on my vacation, then it takes a few days to get over the itch when I start in again."

Many of the workers who were examined said the temporary irritation was similar to blisters on the hands that are the result of unaccustomed manual work while the hands are getting toughened to a job. "It don't bother me none," was the reply repeatedly heard by the author in response to his question as to whether the handling of Fiberglas products caused irritation.

Biopsy Specimens Taken

AT THE request of the author, DR. H. A. CAMPBELL, the Newark plant physician, removed two biopsy specimens of skin from the arm of the newly-employed worker who showed a moderate degree of skin irritation. Serial microscopic sections of this tissue showed a mild degree of capillary dilatation in the corium of the skin. In addition, there were a few scattered lymphocytes around several of the dilated capillaries. The epidermis was entirely normal. No glass particles were found. There was no evidence of fibrosis, bacterial infection, allergy or hyperkeratosis.

Several of the serial sections revealed a small amount of a brownish pigment in the corium which showed no inflammatory reaction around it. It is assumed that this pigment is bakelite, one of the substances used as a binder for the glass fibers. The fact that there was no foreign body reaction around this indicates that this material is an inert substance, and that it does not produce either a foreign body reaction or a fibrosis. The extremely mild inflammatory reaction in the corium of the skin would result from any slight mechanical irritation.

Report of Louisville Dermatologist

DR. ADOLPH B. LOVEMAN, Louisville dermatologist, reporting on an examination of 10 workers who handled Fiberglas, writes, "I did not find any evidence of a definite contact dermatitis in any of the employees although some complained of a mild itching when handling the product. The dermatitis produced was unquestionably of a very mild and transient nature.

"I did examine one patient who complained a great deal of a skin eruption and who felt certain it was due to the Fiberglas. He presented, however, a toxic eruption, and upon questioning him I learned it had been present at times prior to working with Fiberglas. Nevertheless, we removed him from this work for a period of two or three weeks, after which I again examined him and he presented the same type of eruption. In this particular case, it is my opinion that his teeth were probably the foci of infection."

The author believes that the following generalization is warranted by the evidence:

Contact with glass wool may cause ephemeral discomfort among workers inexperienced in handling the material. The skin irritation, however, cannot be regarded as a progressive dermatitis, for it is non-toxic and usually disappears in a few days. In extremely rare instances, where a worker may be predisposed to secondary effects of mechanical skin irritation because of idiosyncrasy, allergy, or the presence of foci of infection elsewhere in his body and otherwise dissociated from the effects of mechanical irritation, lesions may persist. But these cases are encountered with such rarity that they do not justify incriminating glass fiber as a causative factor.

No Claims for Workers' Compensation Validated

FIBERGLAS products have been produced in the Newark, Ohio, plant of Owens-Corning Fiberglas Corporation over a period of nine years. The number of employees has ranged from approximately 20 when production was started in 1933 to more than 1500 in 1941. During this nine-year period no claims for workers' compensation, on the basis of an industrial disease arising out of employment in the manufacture and handling of Fiberglas, have been validated in the State of Ohio.

A letter dated June 17, 1941, from MR. J. A. SHAW, Claims Referee of the Industrial Commission of Ohio, Legal Section, addressed to the author reads, in part, as follows:

> "For your information, we recognize diseases of the respiratory tract as compensable occupational diseases, such as silicosis, asbestosis, anthracosis, and siderosis. As a matter of fact, there is a provision under the law to recognize any disease of this type which is caused by the inhalation of any injurious dusts.
>
> "We endeavor to keep a complete statistical record in the Department of Safety and Hygiene of all cases of this type. I have made a thorough check with this department, and to date we have never had a claim filed for a disease of the upper respiratory tract caused by the alleged inhalation of Fiberglas particles."

Health Better Than Average

THE health of Fiberglas workers is regarded as better than average by the Aetna Life Insurance Company, which underwrites group insurance (life, disability, sickness and hospitalization) for employees of Owens-Corning Fiberglas Corporation. In a letter to an executive of the corporation dated June 11, 1941, JOHN A. HILL, Toledo General Agent of the Aetna Life Insurance Company, wrote, in part, as follows:

> "The health of your employees has been better than average. This is evidenced by the fact that we now have in effect a 35% reduction in rate (from standard) on both the sickness and hospitalization insurance carried by your employees. This is the result of nearly four full years' exposure, and develops a rate lower than any similar industry that we have insured. . . .
>
> "There is in effect a permanent and total disability feature in connection with your life insurance, and as yet there has been only one claim from an employee, and this was due to a non-occupational

accident, far removed from the course of his occupation or from any health hazard in his occupation."

The author regards as particularly significant the following paragraph from Mr. Hill's letter:

". . . our Casualty Company carries what is known as products liability at an extremely low rate, and no claim has ever been presented, indicating, of course, that there is no hazard in the use of Fiberglas or any of its products."

In submitting his best judgment, based on his professional interpretation of all facts assembled in the course of the investigation, the author finds that there is no silicosis, fibrosis or dust hazard connected with working with Fiberglas, and that the manufacture, fabrication and application of Fiberglas products is attended by no unusual occupational hazards.

Head Injuries

—An Analysis With Reference to Accident Prevention—

LT. HYMAN LIEBER, (MC) V (S), U.S.N.R.,
Navy Yard, New York

THE U. S. Navy Yard at New York recently instituted a policy requiring the wearing of safety helmets by all workers exposed to head injuries. It was considered desirable to prepare an analysis of head injuries for a period preceding the new regulation, to serve as a basis of comparison for similar studies after the general adoption of skull guards. Special attention was therefore directed to injuries of the skull, scalp and forehead within the area that can be protected by safety helmets. This report is presented as a characteristic experience at a large shipbuilding plant that does not utilize skull guards.

TABLE I.

DISTRIBUTION OF CASES BY OCCUPATION

Apprentice: Boilermaker	1	
Electrician	1	
Shipfitter	3	
		5
Blacksmith		1
Boatbuilder		3
Chipper and caulker		17
Coppersmith	1	
Coppersmith helper	1	
		2
		8
Driller		
Electrician	12	
Electrician helper	3	
		15
General helper		4
Joiner		3
Laborer		16
Machinist	22	
Machinist helper	3	
		25
Painter		14
Pipecoverer		1
Pipefitter	3	
Pipefitter helper	4	
		7
		2
Plumber		
Puncher		1
Rigger	5	
Rigger helper	5	
		10
Sailmaker		1
Sawyer		1
Sheet metal worker		10
Shipfitter	14	
Shipfitter helper	20	
		34
Shipwright		8
Welder		7
Woodworker		2
		195

Prepared under the direction of CAPTAIN E. W. BROWN (MC) USN, Medical Officer of the Yard.

Frequency of Head Injuries

TWO hundred and fourteen cases of head injury were treated at the Dispensary during the six-month period ending June 30, 1941. This represents a gross yearly incidence of 2.62% of the average industrial complement of 16,257 workers during this period.

Nineteen cases have not been included in this study because the nature of the accident or the location of the injury bore no possible relation to safety helmets or skull guards. The remaining 195 cases represent a yearly incidence of 2.4% of the average industrial complement. In other words one in every 42 workers has a head injury every year.

Time-Loss Due to Head Injuries

ONLY 10 of the cases (5.1%) were serious enough to require pass-out. These 10 men lost 77 days, or an average of 7.7 days each. The longest period of disability was 40 days.

The 10 pass-outs necessitated by head injuries accounted for 1.63% of the 611 tabulatable injuries from all causes during the period of observation, and the time loss they occasioned was 1.02% of the 7904 working days lost because of all non-fatal accidents during the six-month period.

Comparative Hazard of Head Injuries

THE incidence of head injuries varied markedly among the various trades.

TABLE II.

	Average Number Employed	Head Injuries	Yearly Incidence %
Painters	465	14	6.04
Shipfitters	1,343	34	5.4
Laborers	919	16	3.4
Riggers	658	10	3.0
Sheet metal workers	893	10	2.2
Electricians	1,300	15	2.3
Machinists	2,935	25	1.8
Pipefitters	948	7	1.4
Welders	1,208	7	1.0
All industrial employees	16,257	195	2.4

Painters have almost twice as many head injuries as any other trade in the yard. It is noteworthy, however, that these injuries are not serious. Only one required a pass-out and the patient returned to work after two days.

Shipfitters, laborers and riggers form the next most hazardous group. Their numerical incidence of injuries is one and a half times the Yard average.

Type of Accidents Causing Head Injuries

THE nature of the accident causing the head injury was reviewed in all the cases of this series. In 92 cases (47.2%) "something fell"; in 84 cases (43.3%) the patient "bumped his head against something"; in seven cases (3.6%) the injury was caused by a fall; and in the remaining 12 cases (5.9%) the accident was ascribed to such miscellaneous causes as "hit self with shovel," "hit by elevator gate," "hit by coupling while disconnecting air hose," "hit self with wrench that slipped," "hit by swinging chain," "hit by door blown by wind," and "hit by pipe handled by fellow worker."

Head injuries caused by falling objects are potentially much more dangerous than those due to striking the head against overhanging structures; especially when material falls from a height. This difference was not demonstrated in our cases. In fact, it was only by