CURRENT PROBLEMS TO BE DISCUSSED AT BALTIMORE

ENGINEERING COLLEGE OPENS ITS DOORS FOR OPEN HOUSE

Thousands Attend...

The house is open. Come on in and we'll show you around. Now over here, ladies and gentlemen, is the miniature brick plant, and over here is... Once again, after a two year lapse, the engineering college opens its doors on April 4th and 5th and allows the building's knowledge-fluxity humanity to meet and investigate new ideas of engineering science and its ferred to the College of Engineering lifts the latches and puts out the "Welcome" rug for this biennial occasion for which thousands of visitors mi to the campus north of Street and see how makes part of the world go round.

In the enamel lab, souvenir ash trays will be porcelain enamelled in various colors. The complete process of porcelain enamelling will be demonstrated. The "Bake" Base, a Multipurpose Reflectometer, a G. E. thickness gauge, Binks spray booth, and electric furnaces that melt the enamel at 1600 degrees Fahrenheit. A few glaze dipping mechanisms will be exhibited in the pottery laboratory. A bit of pottery cast from a clay slip mixture will also be prepared in this lab.

Better Accommodations For The Department

In 1955 this Department began its duties in two rooms in the third floor of the Natural History Building. In 1961 it moved into a new building which is now part of the Engineering group. In 1912, the present "Klin House" was built. In 1916, the Ceramics Building was completed and two floors and part of the basement were taken over for the use of the department. Since then, the Department has slowly expanded into the space vacated by the other departments and was temporarily housed in the north basement but was transferred to the Testing Materials Laboratory upon its completion.

During the past year, the Natural Resources Building was completed and the Geological Survey was returned to the third floor of the Ceramics Building to its quarters in the new structure.

The space released by the Survey will be shared by the Departments of Ceramic Engineering, Metallurgical Engineering, and other Delinquent Departments. For a long time, there has been an urgent need to accommodate the expanding activities of Ceramic Engineering and this arrangement is gratefully welcomed.

Some of the rooms have been occupied; others will be put into service as quickly as necessary changes can be made.

First Issue Of New "Ceramite"

By Prof. C. W. Parmelee

The present Branch of the American Ceramic Society at the University of Illinois is an active organization, which, its friends may modestly say, is the envy of other similar departmental groups here and elsewhere. The members of the Staff and the Alumni of the Department share in the pride and satisfaction that the S. B. A. C. S. members enjoy in presenting this journal. It is an attempt to bring a little in-depth and deep faith in the great and important industry whose service they are preparing to enter. Their friends are confident that they

Lively Schedule Planned For Visitors At The Convention

Faculty To Present Papers.

Last year it was Toronto; this year it is Baltimore where the annual meeting of the American Ceramic Society will be held. From March 30 to April 3, the conventionists will present, discuss, and deliberate on the important subject confronting the ceramic industry today. The local committee of the Hotel act as hosts for the technical and professional members of the society. The lively schedule will be separated into divisions, namely, enamels, glass, white wares, art, and materials and equipment. Members of the faculty at the University of Illinois will be present on the important topics pertaining to recent research carried out in the department. Professor A. L. Andrews, Dr. B. W. King, Jr., will give two papers, and Professor Zirnons in Soda-Borosilicate Glass and Development of Opalescence in Zirconia Enamel on Outside in Enamel Glass as Dissolved from a Glass Solubility will be present.

John Ceramist Joins The Army

Yes sir, Mr. John P. Ceramist will be marching and camping instead of dancing and cocktail. John will have to convince his wife out of his bed for his eight o'clock departure. This year will be hard on John Ceramist for he has no classes in the army, but then again he doesn't have to be home by 10:30 P. M.

The scars of cannon fire enroled in the advanced R.O.T.C. will leave for their vice-president, Ray graduation in June. After University, William Williard presents the white scroll tied with ribbon on the last day of senior week. Those in the Ceramic Department will throw off the cap and gown and don the military garb. Those men in the senior division of the R.O.T.C. are Tom Huber, John Kimpel, Frank Klane, Duane Lillie, Max D. Newhart, Joe Smith and Al Thornton.

Keramos Initiated

Keramos terminated its activities for the year with its semi-annual initiation banquet. Now under the leadership of William Zehocho, Robert Gills, Robert Pelz, William Mohr, Mitchell Miller, Ed Crichton and Mr. Hugo Filippi of the Illinois Enamel Co. The highlight of the banquet was a speech by Mr. Filippi on "Your Future in Ceramics," talk was followed by the election of the following new officers: President, Keramos President, Bill Fittpark, Secretary-Treasurer; and Secretary-Treasurer, Ray Deverick. The evening’s festivities ended with a theater party.
THE ILLINI CERAMIST

Published by the Student Branch of the American Ceramic Society at the University of Illinois.

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Editor—Arthur Friedburg
Staff
Grove, Roe, Zschoche

FACTORY ADVISORS
Prof. C. W. Parmerlee, J. A. Pask

WHERE CERAMISTS ENTER

This is the first issue of the Illini Ceramist published as a student newspaper. Herefore, the Ceramist has been printed as an annual publication to serve possibly as a souvenir of college memories to those men that go forth with their degree to conquer the problems of the industry.

Now, the Illini Ceramist serves as the departmental organ of ceramic publications at the University of Illinois. This paper will go to 3000 readers—to Illinois graduates and other leading men in the ceramic industry, to those attending the current convention at Baltimore, to the future ceramists in the Illinois High schools, to the students in our department here at Illinois, and to the visitors at Engineering Open House.

The editor wishes to acknowledge with gratitude the helpful counsel and suggestions afforded by the faculty and the cooperation of the Student Branch of the American Ceramic Society. It is the hope that this first issue will be only a small part of the journalistic efforts to be published in the student ceramic newspaper at the University of Illinois.

Substitute For Valendar Clay Is Explored In Lab

The possibility of developing, a substitute for American clay, by dissolving a clay or blend as a substitute for German Valendar Clay is the problem confronting Robert Kimpel, senior in ceramic's research problem for thesis work in ceramic chemistry. Mr. Kimpel is investigating various domestic clays to discover one that will fulfill the need for a commercially satisfactory blend for the porcelain enamel industry.

Since the outbreak of war across the Atlantic, the American enamel industry has been faced with the problem of foreign enameling clay. German Valendar Clay has been cut off. So again we are having to use American substitutes for Valendar, and it is of considerable importance upon foreign enameling clay is at an end.

Some American clays have been found to be quite suitable. Mr. Kimpel has found that with some clays, and this defect seems to be controlled by the amount of bubbles within the glass, and that additions of organic material to a mill addition using a clay will be the only definite determination of organic content of bubble quality.

Organic material, then, seems an important factor to be considered, as are particle size and mineral composition, in stepping toward a synthetic clay. Kimpel is working from two extremes: using a ball clay high organic material and low mineral composition. The other extreme is a high-mineral, low-organic material with high mineral composition and other physical properties being similar to those of Valendar Clay.

New Methods Of Glaze Slip Control Developed

Many of the defects ordinarily encountered in manufacture of glazed ware can be reduced to a minimum by proper control of the glaze slip. Much work has been done to develop simple methods to accomplish this.

For the past two years an investigation of glaze slips has been supported by the Edward Potter Jr. Ceramic Foundation, at the Ceramic Engineering Department of the University of Illinois. Mr. H. Johnson, Chairman, Fellowship, has been in charge of the work, until the present time to the development of a method of evaluating glaze slip properties which will allow the direct application of test results to the study of glaze slip properties and to the study of glaze slip properties for industrial practice. This approach is simple to operate, and is adequate for research laboratory and plant use.

The limits of this new method have not been fully investigated, but the data obtained thus far indicates that this method will be suitable for studying the effects of such variables as clay content, kind of clay, electrolyte, aging, ware content, and grinding, which are associated with glaze slip preparation. However, this new method is possible to designate a glaze slip component. A single number which can be directly correlated with the wall thickness or the firing temperature, for indicating the condition of the bond between the clay and the metal. This unknown, is possible to prescribe the proper glaze consistency for satisfactory application on the metallic ceramic body. This phase of the investigation considers the extremely wide variety of bodies varying from zero to over forty per cent. The data so far obtained is correlated with the results of fired clay and brickwork. This method is being used within the Ceramic Department under conditions simulating practical conditions as a satisfactory method.

By use of this new method, referred to in this article, has not been made public as yet; but it will be when it has received sufficient investigation to definitely establish it as a valuable tool in studying and controlling glaze slip.

Structural Clay Products Characterize Region

Professor Hursh Explains The Field Of Ceramic Materials

The architecture of a region should grow out of the soil and characterize the man and his civilization and conditions of the area. In the central states, where timber resources are lacking or have been exhausted, nature has provided extended deposits of excellent clay materials. In a region such as this, a building conservation project should be as characteristic of the region as a log cabin in the North Woods. No other materials might be worn out, so well variety the natural resources and other unique features.

The imposition of style and purpose in the appearance of clay products is well merited by the properties of the material. Resistant to heat and fire, these products of the earth offer a variety in color and texture that can be provided by no other materials. Utility and aesthetic value are combined in a structure and the utilization is particularly important in the southern states.

The demand for safe and fireproof construction for homes, factories, and public buildings calls for the use of incombustible and fire-resistant building materials. The requirement is adequately met by the brick and tile which, tested and matured by fire, will not be destroyed by fire.

The recent art of brick-making has become a modern industry with developments of machine and mechanical aspects that characterize manufacturing operations in present-day civilization. Such developments have contributed to the knowledge of the properties and characteristics of the materials; engineering equipment and in processing have improved. Improvement in products, variety in texture, and economics in production by more efficient methods have placed the industry on a sounder basis and have eliminated the need handed down from generation to generation of the brickmakers is no longer adequate for the operation of a modern plant. The engineer, with his basic knowledge of the chemistry and physics of the materials and processes and skillful application of his basic principles and engineering principles to the processes of construction can be an important factor in the industry. The need and demand for his services have never been greater. The structural clay products industry will offer many opportunities for the ceramic engineer.

Bloating Produces Tight Joints

Adding small amounts of fluxes to the fireclay to produce bloating of the brick, Mr. L. B. Puncey is using in his researches in developing tight joints in the ladles linings for molten steel. The bloating of the brick joint is poured that will give this tight joint property and will eliminate the difficulty of skill formation. Molten steel is tapped into ladles at a temperature of near 3000 degrees Fahrenheit and the refractory must be able to withstand the erosion, corrosion, thermal shock, slag attack, and other conditions and without appreciable loss in weight, for the protection of the source of impurity in the steel. At the present time, the brick which gives the best results is quite which have a P.C. E. value below the ten per cent for the steel.

This brick becomes somewhat plastic on the surface forming a tough crust and all tightly. This permits metal ingress at the joints and formation of slugs which can not be removed without destruction of the ladle lining.

Seniors Invade Plants

(Continued from Page 1)

was the Harbison-Walker Refractories Company of Chicago, Indiana.

In Chicago, the seniors stopped off the buses into the Chicagno Hotel where accommodations had previously been arranged. Around the Chicago area, the group surveyed the Chicago Refractories Company of Cicero, Illinois; the American Stove Company at Harvey, Illinois; the St. Louis Furnace Company at St. Louis, Missouri; and the Pittsburgh Coke and Chemical Company at Chicago.

The students were greeted and cordially received by the personnel of all plants. The boys were very much impressed with the automatic system of quality testing at the Argenteau Refractories Company and at the Pittsburgh Coke and Chemical Company at Harvey; by the Ball Brothers ventures label, and their appreciation; by the cleanliness at Chicago VII, and by the demonstration of French pottery at Kupino.
GRADUATING SENIORS, CLASS OF 1941


H. R. SWIFT INVESTIGATES ZINC FLASH

Manufacturers of face brick have long known that the metal zinc, when combined with lime, forms a compound which is very resistant to attack by acids. This fact has led to the use of zinc in the production of brick, particularly in areas where acidic conditions are present. However, the use of zinc in brick production has been limited due to the cost. Swift's research into the behavior of zinc in brick has provided valuable insights into the use of zinc in masonry construction.

Ferro Grants...

The Ferro Enamel Fellowship was established under the administration of the student body of the University of Illinois in September 1927 by the Ferro Enamel Corporation of Cleveland, Ohio. The fellowship was made possible by the grant which has been directed by Professor A. I. Andrews, and has had as its aim a better understanding of the fundamental physical and chemical characteristics of porcelain enamels. The fellowship, which is open to students, includes a stipend and a defraying of expenses.

S. B. A. C. S. SCHEDULES

The S. B. A. C. S. is a student organization that promotes the interests of ceramic students. The organization has a schedule of meetings and events throughout the year, including a winter meeting and a summer meeting. The meetings are open to all ceramic students and provide opportunities for networking and professional development.

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CUPOLA PATCH.............Fused Aluminum Oxide
KELLUNDITE............Fused Aluminum Oxide
MAGNA LINE..............Fused Magnesium Oxide
DI-MUL..............Fused Mullite
EROSSET..............Aluminum Silicate

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LOOK INTO THIS...

From microscopic (low) to ultramicroscopic (high), the range of magnifications attainable with equipment now available in the Ceramic Microscopy Laboratory at Illinois both for classroom use and for research. In the expansion of the Department a preparation room of materials for microscopic study is planned.

The laboratory, of which Mr. J. A. Pask is in charge, has student and research petrographic microscopes. One of the research microscopes has a paraboloid condenser (dark field)

PASK PONDERs
SWIFT LOOKS IN

and a carolid condenser (ultramicroscopic) with special objectives and sample holders for their proper use. This equipment extends the range of the Pask's research abilities, including the study of particles of colloidal size, and is needed, particularly in studies of mucous gels, including porcelain enamels and cement clinkers. A photomicrographic camera enables the recording of any section (Continued on Page 6)

The Illini Ceramist

APRIL 1, 1941
Alumni Stationed . . .
Bartow, W. T.—American Lava Corp., Chattanooga, Tenn.
Boeke, J. R.—Owens-Corning Fiberglas Co., New York, N. Y.
Breese, L. K.—Eng. Exp. Station, Ohio State University, Columbus, Ohio.
Cichowski, V. J.—Ferris Enamel Co., Cleveland, Ohio.
Dayton, J. D.—American Vitrified Products Co., Barberton, Ohio.
Ebery, G. B.—(Fellowship Department of Ceramic Engineering, University of Washington, Seattle, Washington.
Greenberg, J. S.—Attending University of Northwestern.
Johnson, H. C.—(Fellowship Orton Foundation, Ceramic Engineering, University of Illinois, Urbana, Illinois.
Karrer, A. S.—American Vitrified Products Co., Brazil, Ind.
Kilmar, H. M.—Atlantic Terra Cotta Co., Perth Amboy, N. J.
Lentz, V. W.—Owens-Corning Fiberglas Co., New York, N. Y.
Lobdell, E. M.—Ball Brothers Co., Muncie, Ind.
Morris, J. L.—Commercial Deal Products Inc., Mt. Vernon, N. Y.
Nutt, A. W.—Harbison-Walker Refractories Co., E. Chicago, Ind.
Ottosen, A. C.—Imperial Glass Students Use Thirty Kilns And Furnaces
A short walk through the kiln house of the Ceramic Department would disclose that there are five kilns of major size, seven small gas furnaces, and about six crucible furnaces. Of the five larger kilns, two are oil as fuel, two gas, and the other is fired by coal.
The oil firing kilns are 5 ft. x 5 ft. x 9 ft. and 3 ft. x 3 ft. x 5 ft. in size and cost $12 to $16 for a 24-hour burn. They are started with gas then change to oil after the fire boxes are well heated.
The gas fired kilns are 3 ft. x 2 ft. x 5 ft. and 4 ft. x 3 ft. x 5 ft. in size. The smaller of the kilns costs $10 to $14 per burn while the larger costs $15 to $19 per burn. The combustion kiln is 3 foot square by 5 feet deep and costs $5 to $7 per burn. Besides these large kilns, there are several electrical furnaces available for the firing of enamels and glasses.
Kryolith is valuable as a flux and at the same time acts as an aid to opacification. It is unusually economical to use, because its fluxing action is strong and long lasting. Also, Kryolith helps dissolve many of the coloring oxides, improves the color and lustre of finished glass and enamelled products, and has excellent opacifying properties.

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Ceramists Dance... 

The Ceramic Ruckus which was presented by the Student Branch of the American Ceramic Society on the University of Illinois campus has the reputation of having the most unique programs of any dance on the campus. The ash trays enamelled with university blue and orange were the basis of the programs given to those attending the dance Jan. 10.

The programs consisted of a blue ash tray with Ceramic Ruckus 1941 fired on the rim which was applied by the use of a screen process into the well of the ash tray was fitted the circular fitter containing the material pertinent to the dance. H. R.

The Ceramic Ruckus (Complimentary Published Publications, Inc.) Rough and W. H. Whitfield, seniors, were in charge of the programs. D. P. Brown and B. D. Bruce were at the head of the Arrangements Committee, and R. A. Thornton, President of the Society acted as general chairman.

The dance is also outstanding in that it is the only departmental dance at the University. The programs for the occasion are made entirely by the student body. Former programs include an enamelled job on a copper base, glass cloth, miniature drain tile with a clear glass, circular enamelled programs bearing an outline of a brick kiln, and the present ash tray.

Thru The Lab...

(Continued from Page 5) by several announcements on the bulletin board and our overcoming curiosity forces us to read them all. One advertisement states that all chemical reagents bottles not in use—should be turned in to the store-room immediately. Another paper ominously announces that reports on Experiment 10 are due the following Tuesday. The last paper is really of interest. It is a list of all the special problems that are being investigated by the seniors. Here are a few of them:

1. Use of molybdenum oxide in sheet iron ground coats.
2. Study of sag resistance of various types of sheet iron.
4. Use of neodyme in sheet iron ground coat.
5. Study of hydrogen in steel.

That mythical trip gives an idea of what is going on in the enamel lab but that is by no means all the laboratory work that is done by the undergraduates. At the present time the juniors are hard at work in the laboratories for their glaze course. In this course special problems are assigned as in the enamel lab course. Senior students in the glaze courses, a number of other experiments are also to be performed. Here is an idea of what the special problems in glaze dealt with.

1. Study of production of copper red glazes.
2. Study and adaption of different glazes in glasses for standard pottery bodies.
3. Development of crystalline and aventurine glasses.
5. Development of glasses for high fire electric insulator bodies.

All these special problems furnish the students with a wonderful opportunity to earn how to conduct an investigation of their own. The results attained in these problems will never revolutionize the ceramic industry but the benefit derived by the students is one of the most educational factors given by the Ceramic Department at the University of Illinois. And it must also be remembered that the time spent in the laboratory offers the opportunity of making with fellow ceramics intimate relationships that will never be forgotten.

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Seniors Design Special Equipment

Under the able guidance of Professor R. B. Hurrah, the senior class of Ceramic Engineers have applied themselves in a struggle to learn all the angles and technical details encountered in designing equipment pertinent to the production of ceramic ware.

Last semester they were given the problem of designing a continuous tunnel dryer capable of handling 45,000 brick per day and a round down-draft brick kiln. Thus far this semester, the engineers have designed a hollow-ware tile die and a lubricated brick die. The rest of the year will be devoted to the study of plant layout.
Factors Affecting Color Investigated

With the ever increasing use of a wide variety of colors, not only for beautifying and decorating kitchen ware, table tops, and the large number of appliances used in the average home, and more recently, in the extensive application of colors to the ever widening field of porcelain enameling, the desirability for a complete understanding of the fundamental factors influencing and controlling the development of color in porcelain enamels has tremendously increased.

At the present time, the various factors such as fineness of grinding, relative size of the coloring agent, and the composition of the color stain are being studied in regard to the comparative effect on the resulting color characteristics. A few of the facilities of the ceramic laboratories which have been invaluable in this work would include: a Premier colloid mill, extensive photomicrographic equipment, a Sharples supercentrifuge, which is capable of producing forces thousands of times greater than that of gravity, (which is very necessary in separating fine particles from a suspension), and most important of all, a spectrophotometric photometer, which gives a continuous recorded graphical representation of the actual colors.

Mr. R. L. Cook, Instructor in Ceramics at the University of Illinois, recently investigated this material as thesis work for a Masters degree.

Steves: "Whenever I'm in the dumps I get myself a new hat.

"Everybody is crazy over me," said the inmate of the first floor of the insane asylum.

THEY KEEP THINGS GOING...

Here they are. Those unsung individuals who act as papas and masas to the footloose ceramists who wander about the building with clay on their shoes and side rules in hand.

"Mac" Mr. W. B. McDevitt (who informs the boys just how much hormone they can have in which to dip their hand-made bricks, superin¬
tends the storeroom and demonstrates laboratory and commercial procedures.

"Vannie" (Miss Vannie L. Shilery) has the "lowdown" on everyone that even satirized the office. Vannie, who has charge of the departmental offices and library, quietly lets the little "clay termites" in the library and reprimands the boys on their contrasting clothes.

Hughie (Mr. J. H. Cahn) initiates the sophomores to firing the kilns. He surely makes it "hot" for the boys. Hughie plays "Jack-of-all Trades" in the building, tending to all necessary incidental work in the kiln laboratory.

SOPHS AND JUNIORS WORK WITH CLAY...

Under the direction of P. M. Corbet, assistant in Ceramic Engineering, the sophomores and junior classes are investigating ceramic raw materials and clay bodies as the essential basic work in ceramic engineering.

The sophomores enrolled in the course, "Ceramic Raw Materials," are operating a complete test of clays, including sieve analysis, bonding strength, slaking properties, P. C. E. test (pyrometric cone equivalent), and draw trials. The effect of anti-plastics on two ball clays as determined by thermal shock, fired and dry strength, and other tests was a recent experiment conducted by the sophomores. Prevention of scumming of trial briquettes was also experimented by the sopho¬mores.

The juniors in their course, "Ceramic Bodies," are studying casting properties of various bodies. Each student spends half of the semester finding the complete physical properties of some designated, special ceramic body.

Destroy 10,000 Pans In Enamel Research

Doomed to destruction are 10,000 perfectly good porcelain enamel pans, which will be destroyed at the University of Illinois Ceramic Engineering department in order that American housewives may have better kitchenware. The pans will be damaged beyond usefulness in research to set up standards for this type of product and to improve it.

Through the Enamel Utensil Manufacturers' council, manufacturers of enamelware are uniting in financing the research at the University, and in providing the 10,000 pans needed. All have agreed to adopt the standards to be set up.

George Zink, University of Illinois ceramic engineering graduate in 1938, has been giving his full time to this research job since September, and expects to spend many more months at it. So far nearly 1,000 standard porcelain enamel pans, from two to four quarts in size, have been sacrificed in research.

Faculty To Present Papers

(Continued from Page 1) presented by Prof. Andrews and Mr. R. I. Swift, Professor Andrews and Mr. R. L. Cook, Instructor in Ceramics, will present "The Relation of Particle Sizes of Flux and Color Oxides of Color Properties of Porcelain Enamels." Dr. A. F. Badger in conjunction with Mr. A. Gibbons will talk to the Glass Session, "The Effect of Ultraviolet Light and X-Radiation on Color of Iron-Bearing Glasses."

In the White Ware Division, Professor C. W. Farnsley and Mr. F. E. Buckles will talk on "The Study of Glaze and Body Interface."

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