

# Mineral Industries

PUBLISHED DURING THE COLLEGE YEAR BY

THE DIVISION OF MINERAL INDUSTRIES EXTENSION

THE PENNSYLVANIA STATE COLLEGE

Volume 5

STATE COLLEGE, PENNSYLVANIA, NOVEMBER, 1935

Number 3

## UNIQUE ART AT PENN STATE

### Industries Aid in Establishing Only Gallery Devoted to Mineral Industries Paintings\*

Five years ago the School of Mineral Industries moved into a new building. Appropriate space to the left of the main lobby is provided for a comprehensive exhibit of Pennsylvania minerals and mineral products. To the right of the lobby is the Dean's office and a conference room for school and industrial meetings. These rooms serve as an art gallery of oil paintings of mineral industrial scenes in Pennsylvania. So far as is known, this is the only gallery in existence which is devoted to mineral industrial paintings. The present collection is valued at \$15,000.

It is curious but true that the layman does not appreciate that Pennsylvania is the greatest mineral industrial Common-

wealth in the world. No single state or country can claim such vast resources and show such a valuable use of its mineral products. Truly, Pennsylvania's mineral resources have been the very heart of her economic development.

High school students fail to recognize the opportunity in the mineral industries or to comprehend the courses of study involved in the three main divisions of work: namely, earth sciences and geography; mineral engineering; and mineral technology. At present there is only one man enrolled in mineral industries curricula in Pennsylvania for each four million dollars of annual value of raw materials and primary mineral products.

The art gallery, as well as a museum, was conceived to aid in the general program of making the citizenry of Pennsylvania mineral-minded. Of course, the paintings have a distinct cultural value to the faculty and students, nearly 1,000 of whom are in and out of the Mineral Industries Building every day.

The mineral industries gallery is made up of original oil paintings depicting the mineral producing and primary processing industries in Pennsylvania and were painted especially for the School of Mineral Industries. Thus far the School has been successful in securing 46 paintings by 17 different artists. These include twelve paintings of coal mining scenes, three of quarrying, seven of petroleum, one of natural gas, five of ceramics, three of fuel technology, and fifteen of metallurgy. Artists represented in the present gallery are Christian Walter, Ludwig Henning, Richard Crist, Robert Valentine, A. C. Daschbach, Thomas Keil, Lawrence Whitaker, Mrs. H. J. Brennan, James Bonar, John W. Raught, Harry W. Scheuch, Edmund M. Ashe, A. H. Gorson, Roy Hilton, H. Ellis, Mrs. Rachel McClelland Sutton and Earl S. Johnston.

\* Reprinted from November, 1935, Alumni News.



Bessemer Steel Plant  
Gift of Arthur G. McKee '91



Bituminous Coal Tipple  
Gift of Tom Nokes, Jr. '35



By-Product Coke Plant



Bee-hive Coke Plant



## Mineral Industries

Published monthly by the Division of Mineral Industries Extension from October to April, inclusive.

THE PENNSYLVANIA STATE COLLEGE  
Division of Mineral Industries Extension  
H. B. NORTHRUP, Director

### Pennsylvania's School of Mineral Industries and Experiment Station

*Dedicated to the exploration, development, and conservation of Pennsylvania's natural mineral resources, and their preparation, processing, and efficient utilization.*

#### FIELD OF WORK

Geology, Mineralogy, Geography  
Petroleum and Natural Gas  
Mining and Geophysics  
Mineral Economics  
Fuel Technology  
Metallurgy  
Ceramics

#### DIVISIONS OF SERVICE

Resident Instruction  
Extension Instruction  
Correspondence Instruction  
Mineral Industries Research

Entered as Second Class Matter at State College, Pa., November 7, 1931, Under the Act of February 28, 1925.

NOVEMBER, 1935

The Pennsylvania State College has never received an appropriation for paintings and other works of art. All of the paintings in the mineral industries gallery are gifts to the School. Alumni contributors are Arthur G. McKee, '91, John C. Cosgrove, '07, Thomas Nokes, Jr., '35, Curtis F. Henning, '34, E. R. Noderer, '31, and Edward Steidle, '11. Other individual contributors are Mrs. A. H. Gorson, Miss Mary Raught, Mrs. Nona R. Elkin, Mrs. Edward Steidle, E. S. Bayard, J. C. Hostetter, E. J. Newbaker, and J. G. Montgomery, Jr., as well as several of the artists. Contributions were made also by the following industrial concerns: Cosgrove Coal Corporation, Harbison-Walker Refractories Company, Pennsylvania Grade Crude Oil Association, Kendall Refining Company and Corning Glass Works.

A number of the paintings are already of considerable historical significance in Pennsylvania. One is of the Diamond Colliery near Scranton, one of the oldest collieries in the anthracite region. Another is of a bee-hive coke oven in the coke region of Pennsylvania, one of the last plants to operate continuously in the State. Another painting made at Johnstown represents one of the first by-product coke plants installed in this country. Another is of the now dismantled Schollenberg rolling mill on the Monongahela River, Pittsburgh. Then there is the Lucy Furnace, one of the oldest blast furnaces on the Allegheny River, Pittsburgh, and a picture of a typical oil derrick at Titusville where oil was first discovered, and another of bringing in a gas well in Potter County. Another painting shows the secondary recovery method of producing petroleum in the Bradford region which was the first region to employ this method. Another painting is of one of the last drift mines employing mule haulage in operation in western Pennsylvania. One shows an abandoned

limestone quarry near Bellefonte, and another, "off-hand" glass blowing at Pittsburgh. Then there are the companion pictures showing the ladling and the pouring of the large telescopic disc, made by the Corning Glass Works on December 2, 1934. These are the only two paintings in the collection which are not Pennsylvania.

Prominent mineral industries leaders in Pennsylvania visit the School regularly and are always enthusiastic about the gallery. They did not realize the artistic side of the mineral industries. Several men have had paintings made for their offices while others have obtained ideas for illustrated advertisements and calendars. A number of men have proposed that the collection of paintings be exhibited in various mineral industrial centers in Pennsylvania and two specific requests have been received already. Plans call for a gallery of about 75 paintings.

The gallery has received national recognition as attested in numerous favorable illustrated articles appearing in the press. Noticeable among these articles is "Art Gallery Devoted to Mineral Industries" by the Art Editor of *The Literary Digest* and carried in the April 6, 1935, issue of that magazine, and the special article, "Pennsylvania State College has only Art Collection in America Devoted to Mineral Industrial Themes" by the art critic of the Pittsburgh Press and published in the May 6, 1935, issue of that paper.

The first local exhibition of the gallery was held on April 10, 1935, with an attendance during the day and evening of about 6,000 people.

Reproductions of paintings contributed by the industries, friends and artists will be carried in subsequent issues of MINERAL INDUSTRIES.



Blast Furnace Plant



By-Product Coke Plant



## CERAMICS DEPARTMENT NOTES

On Friday and Saturday, September 20 and 21, the Ceramic Department played the role of host to the Refractories Division of the American Ceramic Society, for its summer meeting at the Centre Hills Country Club, State College, Pa.

An interesting program of five speakers representing several phases of consumer interest, particularly steel and non-ferrous metallurgy, glass, and steam power generation, had been prepared. The meeting had been well advertised and as a result over sixty men from Pennsylvania, New York, Ohio, Maryland and West Virginia were in attendance. One man, Dr. A. E. R. Westman, came from Toronto, Canada.

At the luncheon Dr. R. B. Sosman, Trustee of the Division, called the meeting to order and introduced Mr. H. E. White, Mr. H. M. Kraner and Dr. N. W. Taylor who had organized the meeting. He then called on Dean Edward Steidle of the School of Mineral Industries who welcomed the visitors. Immediately after the luncheon the technical session began, under the chairmanship of Mr. J. M. McKinley, President of the American Ceramic Society.

The afternoon meeting was well attended and all papers heard with great interest. The speakers took their job seriously and described clearly some of the service requirements and conditions which refractories must face. There was a healthy discussion which would have been longer if more time had been available. The program continued until 6:00 p. m. A sandwich supper in a mountain cabin followed immediately and the evening was devoted to informality and relaxation.

On Saturday morning a number of golf matches were started, and a considerable group of visitors inspected the laboratories of the Ceramics Department as well as the other divisions of the School of Mineral Industries.

The School extends an invitation to the Refractories Division to return again at an early date, for such meetings are of real benefit to all concerned.

On Friday, October 18, Mr. R. A. Miller, Technical Sales Engineer, Pittsburgh Plate Glass Company, visited the Department of Ceramics and gave an illustrated talk on recent developments in the sheet and plate glass industry. He emphasized particularly the field of heat absorbing glasses for exclusion of the infra red part of the spectrum and thereby making a room cooler in summer and warmer in winter. Going on to the question of air conditioning he mentioned the trend toward double glazing as a means of cutting down heat transfer. Heat strengthened glass was described also and its application in porthole windows, etc., for naval vessels. The improvements made in polishing technique, due to better control of the rouge materials, was emphasized also. The talk brought out clearly the value of scientific control all along the line, in glass manufacture.

Mr. Ross C. Purdy of Columbus, Ohio, General Secretary of the American Ceramic Society, visited State College on November 6, and addressed the Student Chapter at that time. His talk was on Technical Advances in the Field of Abrasives. Mr. Purdy has just returned from a trip to the west coast and had something to say also about ceramic development there.

Dr. F. O. Anderegg of Long Island City was a recent visitor to the Department. Dr. Anderegg has been conducting some experiments on light-weight sand-lime brick at Mapleton, Pa.

Mr. H. I. Smith, Chief of the Mining Division, U. S. Geological Survey, Washington, D. C., attended the Alumni Homecoming on October. His son Donald Smith is a sophomore student in the Ceramics curriculum.

Dr. Nelson W. Taylor recently visited Washington, D. C. to consult with various members of the Bureau of Standards, Bureau of Chemistry and Soils and Geophysical Laboratory regarding the research program of the Ceramics Department.

Mr. Bennett Ellefson is engaged in a study of the mechanism of adherence of glass to metal, particularly the problem of wetting of the metal surface by the glass. Mr. Edward C. Henry is working on the plastic flow of clay pastes in relation to the colloidal properties of the respective clays as determined by standard methods. Mr. Paul L. Smith is undertaking a fundamental study of the factors underlying "freezing" of pyrometric cones. Mr. Allen Martin is carrying on an investigation of the mechanism of reactions between solids in absence of a liquid phase. Mr. E. P. McNamara is working on the problem of strength of glass fibers.

Mr. Paul McCloskey, Penn State 1935, is engaged in enamelling activities with the Frigidaire Corporation at Dayton, Ohio.

(Continued on page 4)



Ceramics Conference Group at Centre Hills



## NEW EXHIBIT HONORS MEMORY OF FIRST PRESIDENT OF THE COLLEGE

Scientific instruments and materials used by Dr. Evan Pugh, first president of the College (1859-1863), and one of the foremost scientists of his age, have been placed recently on display in the museum of the School of Mineral Industries.

The most important items in the collection consist of a microscope, blow pipe outfit and a set of glazed clay crystal models used by Dr. Pugh while a student in Mineralogy in Austria and Germany and brought back with him to this country. The set of crystal models was made by Dr. Pugh. Another interesting item is a blow pipe outfit used on a mineral industries project in Dr. Pugh's laboratory by a member of the first graduating class of the College in 1861.

All of the instruments and materials have been prepared as a permanent exhibit on the first floor of the Mineral Industries Building where it will be preserved for posterity.

The School of Mineral Industries and Experiment Station is a product of the early visions of Dr. Pugh. That Dr. Pugh was vitally interested in the development of the mineral industries of Pennsylvania was not alone manifested during his six years of study in Europe but in his many visits to the Valentine iron furnaces of Bellefonte which led to meeting the young woman, Miss Rebecca Valentine, who later became his wife. Dr. Pugh took with him samples of many Pennsylvania rocks and minerals for exchange in Europe. Three of the eleven theses of the first graduating class of 1861 were on mineral industries problems, namely, "Limestones of Nittany Valley", "Slags of Iron Furnaces and the Residual Products obtained in Converting Pig Iron into Bar Iron", and "Iron Ores of Nittany Valley", which further revealed Dr. Pugh's interest in guiding students in mineral industries work.

## MINERAL INDUSTRIES EXPERIMENT STATION

The Rochester and Pittsburgh Coal Company has established a research fellowship for the academic year 1935-36. The purpose of this fellowship is to encourage fundamental research on coal in the Department of Fuel Technology. Mr. Kenneth Ray, B.S., Chemical Engineering, University of Minnesota, 1935, has been appointed to this fellowship.

Dr. Elliott P. Barrett, Research Associate in Fuel Technology, presented a paper entitled "A Furnace for the Measurement of Coal Ash Softening Temperature" at the 38th Annual Meeting of the American Society for Testing Materials, Detroit, Michigan, June 28-30, 1935. This paper describes a furnace designed for the specific purpose of determining coal ash softening temperatures and which is readily adaptable to measuring cone deformation temperatures in general up to 3000° F. (1650° C.). The furnace is of the horizontal muffle type and is so constructed as to permit the cones to be viewed against a background somewhat lower in temperature, so that they are readily visible at all temperatures between 1500 and 3000° F. (815 and 1650° C.). The paper emphasizes the advantages of the horizontal muffle type of furnace over the conventional pot furnaces. It points out that the difference in design between these two types of furnaces does not effect the results obtained because the conditions in the horizontal muffle furnaces meet the requirements of the A. S. T. M. methods for determining ash softening temperatures. The construction of the furnace is described in detail and is critically discussed. Comparative results obtained in this furnace with those obtained on the same ashes in pot furnaces are presented. In conclusion, a critical discussion of the technique of the ash softening measurements is presented.

This paper will be available shortly as a reprint of the Mineral Industries Experiment Station.

Bituminous Coal Research, Inc., has renewed its research grant in the School of Mineral Industries for another year. Dr. C. C. Wright will continue in charge of the project which is concerned with the hydrogenation of bituminous coal.

Dr. Maynard M. Baldwin has recently joined the staff of research assistant in fuel technology. He received his undergraduate training at Whitman College; and took graduate work in chemistry and physics at the University of Washington, receiving the Ph.D. Degree in 1935. He is a member of the honorary societies of Sigma Xi, Phi Lambda Upsilon (chemistry) and Sigma Pi Sigma (physics). Dr. Baldwin will work with Dr. Wright on the hydrogenation of coal.

## MINING AND GEOPHYSICS

Professor Wm. R. Chedsey read a paper on the Diesel Engine and its application to the coal industry before the Coal Mining Institute of the Fifteenth Bituminous Inspection District at Barnesboro, Pennsylvania, Saturday, October 26.

The American Academy of Arts and Sciences has made a grant-in-aid of \$300 to Dr. Helmut Landsberg of the School of Mineral Industries' staff to be spent for research on air suspensions. The problems arising in modern industry through air pollution by smoke and dust require fundamental research on the properties of the suspended material, mainly the determination of origin, size and constitution of the particles. Older studies by Dr. Landsberg in this field are going to be continued and completed by this grant.

## Ceramics Department Notes

(Continued from page 3)

Mr. Donald Wertz, Penn State 1935, is in charge of development of refractories at the Donora Zinc Works of the American Steel and Wire Company, Donora, Pa.

Mr. Harry Whittaker, Penn State 1935, is taking graduate work in Ceramics with Professor F. H. Norton at Mass. Inst. of Technology.

Mr. Marvin Lewis, of the class of 1937, was awarded recently a scholarship to study for a year at Lingnan University in China. Lewis recently wrote from Shanghai to say that his trip to the Orient had been very exciting and very interesting. He had particularly enjoyed his two weeks in Japan. He will return next September to complete his work in Ceramics. Mr. Lewis comes from Wesleyville, Pa.

