

Stimulating Small Industries

Surveys and Research by University Of Oklahoma Agencies Can Be of Valuable Assistance in Developing New Factories



In the materials testing laboratory, part of which is shown above, the University can make authoritative tests of value to prospective new industries.

NEW appreciation for the part the University is playing now, and might play in the future, in the industrial development of Oklahoma has grown among civic and business leaders of the state in recent months.

Realizing that the state's income from agriculture and oil are more likely to decline than to increase, numerous organizations and public officials have supported a movement to encourage establishment and development of more industries scattered throughout the state to utilize Oklahoma's wealth of natural resources.

The general idea is well expressed in the slogan, "Natural Resources plus Local Industries plus Cooperative Engineering Research equal Jobs and Wealth in the State."

A conference called at Oklahoma City last month by Governor Leon C. Phillips, '16law, for presentation of reports by committees investigating industrial possibilities for the state was expected to attract a few hundred persons and actually drew nearly nine hundred interested persons. Steps toward establishment of a permanent organization to encourage new industries by coordinating the efforts of interested groups were taken at this meeting.

One committee recommendation at this meeting was increased financial support for research at the University, particularly in the laboratories of the Oklahoma Geological Survey and the School of Chemical Engineering.

Oklahoma has a combination of fuel, raw materials and markets that offers distinct advantages to new industries.

Mineral industries which Robert H. Dott, director of the Oklahoma Geological Survey, believes feasible on the basis of research already completed include:

1. Rock wool.
2. Bleaching clays for refining lubricating and vegetable oils from northwest Oklahoma bentonites.

3. Mining of manganese ore in the Arbuckle Mountains (for use in munitions) during the present emergency.

4. Mineral fertilizer, especially limestone.

5. Cheap paint from hematite (the best known deposit already has been acquired by commercial interests).

Possible potential mineral industries, which would require additional research to justify, include:

1. Asphalt roofing and roofing paints, from asphalt wells and refineries.

2. Roofing, varnishes and mastic floor tile from east Oklahoma grahamites.

3. Coke and by-products from Henryetta and McAlester coal.

4. Plastic magnesia from dolomite.

5. Chemical industries based on salts from salt springs and oil field brines, limestone, sulphuric acid, derivatives of natural gas, and coke by-products.

6. Dishware, if suitable clays can be found.

The Geological Survey is prepared to assist prospective new industries by locating water supplies which are essential to some mineral industries; by doing field work to discover mineral resources; by determining the chemical and physical properties of the mineral deposits; and by determining their suitability for use by controlled production in the survey's industrial research laboratory.

This takes the prospective new industry to a stage where engineers can step in and build a "pilot plant" for regular production with the objective of eliminating any "bugs" in the process and working out the best means of handling the raw materials.

The College of Business Administration at the University has recently started a program of research work to aid small businesses, and this will fit into the industrialization program by giving assistance in the surveying of potential markets for new

products, and solving other business problems faced by new manufacturing firms.

W. H. Carson, dean of the College of Engineering, recently was invited to speak to the Oklahoma City Chamber of Commerce on "Training Engineers for Developing Our Natural Resources." His address caused so much favorable comment that it was reprinted and widely distributed to Oklahoma business men.

Dean Carson pointed out that the average person knows that the building of the Panama Canal, Boulder Dam, the Golden Gate Bridge, and the Empire State Building, are great engineering achievements, but he is seldom conscious that all around him are the works of professional engineers—highways, radios, telephones, automobiles, airplanes, refineries, water works, the production of oil, and all manufactured products.

The engineer not only designs and supervises the building of material things, but develops new materials and methods, increases efficiency, reduces effort, eliminates waste, and increases production. With vision, resourcefulness, and ingenuity, he labors to increase the comfort, wealth, and safety of his fellow men.

If engineers are to play such an important part in the development of the state, certainly they should receive the very best of training for that part. The engineering profession is divided into several general divisions. Each division is subdivided into branches which cover specialized phases of work. The College of Engineering at the University comprises the following schools:

Architecture	General
Chemical	Geological
Civil	Mechanical
Electrical	Mining
Engineering	Natural Gas
Physics	Petroleum

The University of Oklahoma, like all state-supported institutions of higher learn-

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ing, is a service institution. Each year the College of Engineering sponsors a number of short courses of an educational nature that aid in industrial development.

In the early days, many theories and formulas were advanced in regard to gas measurement and related subjects. Finally, it was decided that the best way to answer all questions and solve all the problems would be to have a common meeting ground for the engineers, meter men and executives. So, the Southwestern Gas Measurement Short Course was organized at the University in 1924, to meet this need. It is an annual event and last year the registration in this Course was 542, with 27 states represented.

In addition to this short course, the College of Engineering sponsors a Highway Conference, a Colloidal Symposium, a Radio Short Course, a Building and Construction Men's Conference, a Welding Conference, a Machinists' Conference, and a Petroleum Fluid Metering Conference, all of which are beneficial to Oklahoma's industrial development. The printed proceedings of these courses have world-wide circulation.

Co-operative research with various national professional engineering societies, and with state industrial concerns, goes on continually. Through cooperative research the college has accumulated approximately \$250,000 worth of permanent laboratory equipment, and at the same time furnished the sponsors with valuable information that has proved useful in developing processes and materials in industrial operation. The first major piece of laboratory equipment donated to the University was a commercial size fractionating type refinery. During the year 1926 a certain foreign country agreed to purchase a number of small refineries if the manufacturer would build one and install it in the laboratory of a recognized university of the United States and have the faculty and students make runs on certain crude oils to demonstrate whether or not the refinery would produce the products as specified. The University of Oklahoma was selected, the refinery installed, and experimental runs made. The foreign country was satisfied and purchased a number of the refinery units. The test refinery became the property of the University.

The first cooperative research project with the American Petroleum Institute was on the study of the flow of oil and gas mixtures through porous media. The findings were published in the American Petroleum Institute Journal.

To eliminate guess work in building equipment necessary to drill oil wells to greater depth than those reached in 1930, the American Society of Mechanical Engineers appropriated funds to make a detailed investigation to find out power re-

quirements, steam consumption, lifting loads, and overall efficiency during the course of drilling a well. This investigation was made in the Oklahoma City field by the faculty and students of the College of Engineering.

Instruments and apparatus were installed on every piece of the drilling equipment. Numerous student groups assisted with the tests in calculating the data. A 42-page bulletin covering the findings of the research was published by the American Society of Mechanical Engineers and this work is still used as a guide in designing deep-well drilling equipment. After the tests were completed, the instruments used were donated to the University. In appreciation of the work, one manufacturer gave two oil field type super-heat boilers, another a full-size slush pump, and others the necessary auxiliary equipment to put the boilers and pumps in operating condition.

FOR the last six years the American Gas Association has sponsored a fellowship at the University of Oklahoma. A major portion of the research done by students holding this fellowship has been directed toward ways and means of eliminating the "freeze-up" condition of gas regulators during extremely cold weather. The field work for this project has been done in the Fitts pool and the Oklahoma City oil field.

Aeronautical research was begun at the University in 1928. The students designed and built a special type of glider. In 1932 the University's first wind tunnel was constructed. The wind tunnel was built for testing 12-inch model airplanes, but was found to be impractical for scientific investigations. A commercial size wind tunnel with a 5-foot opening instead of a 12-inch was designed.

The main structure was built with State and PWA funds in 1936, and as soon as funds become available it will be equipped with the instruments and apparatus necessary to perform tests on model planes. It is over 60 feet in length and the main structure is three stories high. A 500-horsepower engine, furnished by the Navy, is used to turn the propeller. When the wind tunnel is completed the air stream is expected to attain a 300-mile-per-hour velocity. Before any new type airplane is built, a scale model is made from the designer's drawings and the model thoroughly tested in a wind tunnel. When completed, the O.U. wind tunnel will form a valuable piece of regular equipment for aeronautical research and instruction.

The College of Engineering also is conducting research with reference to the secondary recovery of oil. With present production methods only about 20 per cent of the oil in the ground can be recovered. In the future, secondary recovery methods are certain to play a great part in the production of oil.

An air conditioning research laboratory has been installed at the University, and in the near future Dean Carson expects to

work out a cooperative research program with the School of Medicine, with reference to air conditioning and its relation to health. Another phase of air conditioning research will be its relation to manufacturing processes. It is common knowledge that the plant workers of the South are not as productive as those of the North, because of the warm climatic conditions in this section of the country. All modern plants are being air conditioned, not only for the comfort of the employees, but to increase production and uniformity in the products manufactured. Climatic conditions are no longer a limiting factor in considering the location of new industries.

"Oklahomans have been so busy developing the petroleum industry that they have not had time to develop those basic industries that manufacture everyday necessities." Dean Carson comments. "Instead of sending our money out of the state to buy necessary commodities, local industries should be established so far as it is economically practical to do so. These local industries may be branch plants of some of the larger industries of the North and East or they could be independent home-owned industries. In either case, if they are to meet commercial competition, their products must be equal to, or better, than those manufactured in the larger plants. To insure high quality merchandise, the staffs of the smaller industries should have access to laboratories suitable for research and a complete technical reference library.

"The industrialists of many states look to their institutions of higher learning to assist them in solving their numerous problems. This work is carried on through company supported industrial research fellowships. Such a cooperative plan should be worked out at the University of Oklahoma."

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Pilot flies historic route

Maurice Marrs, '20ex, who pilots a passenger plane between Java, in the East Indies, and western Europe, finds his work "like a dream coming true day after day." Points along this Royal Dutch Airlines route never cease to bring to his mind visions of mystery and adventure, as his route includes Naples, Athens, Alexandria, Jerusalem, Bagdad, Calcutta, Singapore.

Because of the international strife in Europe, Mr. Marrs has become almost invaluable to his company. Mobilization in Holland has taken men from their jobs, leaving about a dozen American pilots the backbone of the airline's staff.

The national spotlight was turned on Mr. Marrs several years ago when he was a pilot with United Airlines. He made a successful forced landing with a plane full of passengers in a blinding Ohio snow-storm, then set out on foot and alone for help.

Flying lessons at the Oklahoma City airport proved to be the beginning of a successful piloting career for him.