



The pictures above show some of the new equipment installed by the College of Engineering during the last year. On the left, J. W. Donnell inspects equipment used in studying characteristics of latest type automobile motors. The other photograph shows new equipment in a corner of the machine shop.

Engineering Progress Report

By Dean W. H. Carson

GREETINGS to O. U. engineers everywhere. When I say "everywhere" I mean all over the world, because the sun never sets on O. U. engineering graduates. Whether you are in Persia, China, Sumatra, South America, Rumania, California, New York, Oklahoma, or any other section of the world, I know that at this time you will be reminiscing about the good old days at O. U., especially that one day of the year, March 17, when we honor our patron, Saint Patrick.

Hardly a day passes that I do not hear of a well deserved promotion of at least one O. U. engineer, or that one of them has launched into a successful business career of his own.

It is also very gratifying to know that so many of our men have reached responsible places in the industry and are now in a position to employ our engineering graduates. Many are requesting recommendations for one or more young engineers who will graduate in June.

Speaking of employment, the outlook for jobs this year is exceptionally bright. As a matter of fact, practically all of our seniors who completed the work for a degree at mid-term have been employed. And it was the largest group we have ever had finish at the mid-year period. I maintain that the College of Engineering has the best professional record of any major university or college in the country.

It is probably difficult for some of the older engineering graduates to realize that we now have sixteen hundred students enrolled in the College of Engineering. As you probably suspect, crowded conditions exist everywhere and more floor

space must be obtained if we continue to uphold our high scholastic standards.

Professional engineering courses are being taught in practically every building on the campus, including the football stadium, the military science stables, and the basement of the University Library. Our laboratory equipment, of which approximately \$300,000 worth has been donated by the petroleum industry, is scattered in eight different buildings—some of them are no more than shacks.

Our technical library has a seating capacity of only twenty students. It is impossible for the students to study there or take advantage of the reference material. Classrooms are overcrowded. In some instances it is necessary to use folding chairs to supplement the table-armed chairs regularly installed in the rooms. All office space is utilized, with three or more professors in each small office room. Under such arrangements it is impossible for the instructors to carry on an effective advisory system.

Because of these intolerable conditions, we are again asking the Legislature to appropriate funds for an engineering building at the University.

The structure we propose to build has been designed especially for engineering educational purposes. There isn't another building on the campus, or in the Southwest, that could be made over to take care of our College of Engineering properly. We know that engineering development throughout the world is still in its infancy and we intend to install in this proposed building, laboratories and other modern facilities that will enable our Col-

lege of Engineering to take an active part in the growth and development of the industries and natural resources of the Southwest.

The engineer's motto is, "Service to the State and its people." You never hear an engineer preaching a lot of "isms." His feet are on the ground. He is master of the laws of nature. He uses his knowledge of mathematics, science and economics as a foundation for his plans; he bends the materials and forces of nature to fit these plans and rears a structure for civilization. His sole purpose in life is to increase the comfort, wealth and safety of his fellow-men.

I ask every Oklahoman to pause for a moment and think what the engineer and engineering has done for you. All about you are the works of engineers. Your home is filled with modern conveniences that have been developed by engineers. We must not stop progress, so I ask all O. U. alumni and all citizens within the boundaries of this State to come forward and join the forward march to see that we receive adequate appropriations for a suitable College of Engineering building at O. U.

We are asking the State Legislature to make an appropriation, not because of a selfish whim, but because it is a *sound* investment for the State. Our engineering graduates are engaged in professional engineering work in practically every type of industry. I feel justified in saying that the accomplishments of our graduates in increasing the efficiency of operation of the automobile, radio, telephone, electric lights, sanitary system, building construc-

tion, etc., have caused an annual saving of more than \$3.00 per person for each resident of the State of Oklahoma; and \$6,000,000 is quite a saving in any man's language.

The College of Engineering at the University of Oklahoma, in addition to performing its regular curricular activities, takes an active part in serving the people and industries of the State. The fifteenth annual Gas Measurement Short Course will be held at the University April 18, 19, and 20. During the past fourteen years 7,160 adults have attended this course to study important problems regarding gas measurements. A total of 107,400 man class-hours of instruction have been given to these men. This is a service that pays dividends the moment the men return to their jobs. The College of Engineering sponsors not only one but eight such short courses. We serve the people of the State in many ways; principally of course, by training young engineers. We conduct constructive research projects, and aid state engineers and others by giving them liberal use of our technical library.

The following is a composite report on the recent activities and developments of the College of Engineering submitted by faculty members from each school and department in the college.

ARCHITECTURE

The School of Architecture sponsored a short course for the construction industries February 22, 23 and 24. This year the Portland Cement Association presented its annual Oklahoma conference in connection with the short course at O. U., instead of holding it separately in Oklahoma City as in the past.

Co-operation with the Beaux-Arts Institute of Design in New York City was continued, and three O. U. students were among the winners in the first preliminary contest for the Paris Prize contest, one of the most important student competitions held in the United States. Only about thirty students were chosen from the entire nation to enter the second preliminary. Only one other school in the nation placed as many as three students in the second preliminary and it is the University of Illinois which has probably the largest School of Architecture in America. The three O. U. winners are Joe Boaz, Nat Baker and Paul Jeffries.

Additional space for the School of Architecture was provided during the last year by construction of an extension on the second floor of the Engineering Laboratory. Already, however, the department is becoming crowded even with the additional space.

Several transfer students have come to the O. U. School of Architecture during this year, including two from Southern California, one from Texas A. and M. College, one from Colorado, and one from Panama.

CHEMICAL ENGINEERING

Enrolment has increased substantially during the last year, although the staff is putting emphasis on improved quality of instruction. A number of research projects are being carried on by students and faculty members.

Dr. R. L. Huntington is conducting research on the unsteady flow of heat through reservoir sands, the diffusion of gases through porous media, and the formation of hydrocarbon hydrates. He is planning further research on some refinery problems.

Removal of hydrogen sulfide from natural gas is being studied by Dr. C. T. Langford. He is also doing research on the pyrolysis of methane, and heat transfer to boiling liquids. He proposes research work on corrosion studies applied to petroleum equipment, heat transfer through films, and gum formation in gasoline.

J. W. Donnell is conducting research on vacuum drying, humidification, study of oiliness, colloidal properties of drilling muds, monomolecular oil films, and motor testing of lubricating oils. Because advancement in motor design and lubricating oil manufacture has been so rapid in the last ten years, standard tests for automotive lubricants have been rendered useless, Mr. Donnell believes, and he is making actual motor tests on 1939 automobile motors to distinguish between satisfactory oils.

Members of the Chemical Engineering staff are active in the American Institute of Mechanical Engineers, the American

Institute of Chemical Engineers, the Society of Automotive Engineers, and the American Chemical Society.

CIVIL ENGINEERING

During the last year the School of Civil Engineering has added equipment and extended the laboratory facilities for investigation in soil mechanics. The properties of soils and their behavior under the various conditions of loading are important to engineers charged with the safety of structures and conservation of water and soil. As buildings, dams, and other structures increase in size and weight the necessity of adequate knowledge concerning the supporting power of soils is imperative.

The Grand River Dam in eastern Oklahoma is an example of major engineering projects demanding thorough information on soil properties. M. E. Mills of the O. U. faculty has worked on this project.

The well-equipped Highway Materials Laboratory is being used now to investigate the use of cotton in the construction of highways, and if the preliminary steps give promise, this field of research will be developed.

The Third Annual Highway and Street Conference was held at the University in December with national and state authorities participating in the program. Highway and street design, construction, maintenance, finance and administration were discussed. Proceedings of the conference are being prepared for publication.

N. E. Wolfard, associate professor of civil engineering, prepared material for Part I of an Oklahoma Geological Survey Bulletin entitled *Traverse and Leveling in Oklahoma*, which contains elevation and position data in constant demand by federal conservation engineers and by geophysical research men, geologists, county and municipal engineers, and other engineers. Manuscript for Part II is now being prepared.

ELECTRICAL ENGINEERING

As is the case in many other divisions of the College of Engineering, the classes in electrical engineering have been filled to overflowing. New sections had to be added in several of the recitation courses, and an additional morning laboratory period on Monday morning added to take care of the increased enrollment in electrical courses for students not enrolled in the School of Electrical Engineering.

The Fourth Annual Radio Short Course sponsored by the school was held the first week in February, 1938, under the direction of C. L. Farrar. About one hundred thirty persons registered in attendance, including men from twenty-one cities in Oklahoma and others from Texas, Arkansas, and Kansas. The radio

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W. H. Carson, the hard-working dean of the College of Engineering and director of the Schools of Mechanical and Petroleum Engineering.

Engineering Progress Report

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course this year is scheduled the middle of March.

There has been no change in or addition to the teaching staff, but the number of students taking electrical work is about twenty per cent larger than ever before.

Besides receiving much equipment donated by various companies, the school has purchased two motor generator sets for use in electrical machinery laboratory.

All of last year's graduates are employed or doing graduate work at various institutions.

ENGINEERING DRAWING

Several faculty changes have been made in the Engineering Drawing Department. Sam C. Holland joined the staff in September, replacing L. H. Cherry who was transferred to the School of Mechanical Engineering.

Harold K. Bone joined the department February 1 to replace Frank R. Campbell who resigned to accept a position at the Colorado School of Mines.

One new course has been added—E. D. 200, which is designed to satisfy a demand for additional work in drawing beyond the regular prescribed work.

GENERAL ENGINEERING

The demand for engineers with a sound fundamental training in the sciences and an outlook broadened by some contact with that group of subjects known as the "humanities" is growing.

An increasing number of young men inquire as to the possibility of selecting mathematics, physics and mechanics courses for their electives. These men have as their objective work in the field of design and development, or research. Others wish to concentrate on design courses, metallurgy and chemistry, with the possible objective of entering the field of design of welded structures. Or they may combine these subjects with electives in business and finance with the idea of entering the fields of manufacturing and sales.

Students in general engineering last semester put into effect a system of tutoring designed to help students having difficulty with some of their subjects, and the results have been gratifying. The club formed by this group now has a membership of twenty.

GEOLOGICAL ENGINEERING

During the last year, G. E. Anderson has been acting director of geological engineering.

The Geological Engineering Club has been reorganized and at monthly meetings of the club, prominent members of the profession are invited to give talks relating to their work in practice.

ENGINEERING SHOPS

The Engineering Shops have been thoroughly modernized with installation of new machinery during the last year.

All courses offered by the department have been reorganized and new ones added so that a student may take advanced work in machine shop, wood work, and welding, and carry on research in these fields.

A new feature of the shops is an industrial arts curriculum for teachers. Something else new is the welding shop, which is perhaps the most modern and complete of any in the Southwest.

Partially as a result of the shop improvement program, there is an 85 per cent increase in enrolment in shop courses as compared with last year.

The Engineering Shops Department is sponsoring a Welding Short Course March 9 and 10, and a Machinist Short Course April 7 and 8. Both are primarily for mechanics, shop foremen, and superintendents, but are open to the general public.

Two welding research projects are under way, in co-operation with the Fundamental Research Division of the National Welding Research Committee, a committee that is sponsored by the American Welding Society, the American Institute of Electrical Engineers, and about twenty large industrial concerns.

The first is an investigation of the most satisfactory method for repairing trepanned inspection holes in welded seams. The second consists of determining the comparative welding and economic value of three different gases used in the gas welding and cutting process. These are acetylene, now in general use; butane; and propane. Two large industrial concerns are donating equipment and material.

MECHANICAL ENGINEERING

Enrollment in the School of Mechanical Engineering continues to increase steadily, probably because graduates have been successful in finding satisfactory employment in recent years.

The increase has added a great deal to the teaching load, a condition that was alleviated somewhat by the addition to the faculty of De Owen Nichols, Jr. Mr. Nichols is a graduate of Alabama Polytechnic Institute and was formerly with the Tennessee Coal, Iron and Railroad Company.

Sylvan Cromer, instructor in mechanical engineering for a number of years, resigned in 1937 to take a position as assistant professor of petroleum engineering at Louisiana State University. The vacancy was filled by Laurence H. Cherry who was transferred from the Engineering Drawing Department.

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"Come See Us, Mr. Engineer"

Engineer alumni back this month for the St. Pat's celebration or for one of the various short courses and conferences sponsored by the College of Engineering are cordially invited to make the Union Building their headquarters on the campus . . . Cafeteria, News Stand, Book Exchange, Main Lounge and Recreation Room await you, ready to serve you and make your stay in Norman a happy one.

The Oklahoma Union

Lavoys E. Dietrich was added to the staff as mechanic, succeeding W. T. Tiffin who is now an instructor in mechanical engineering and teaches courses in welding.

The school received a number of pieces of equipment from the industry during the last year, the largest being a two-cylinder Clark Brothers gas engine.

Facilities in the fuel testing laboratory have been materially improved and the amount of scientific research done has been greatly increased in the last two years.

The school again sponsored the annual Southwestern Gas Measurement Short Course in April, 1938, and had an attendance of six hundred persons, including representatives from twenty-seven states and several foreign countries.

The first oil metering conference, also directed by Dean Carson, had an impressive beginning April 18-20, 1938, with an attendance of 150 despite bad weather. Both of these conferences are scheduled again this year with indications of record attendance.

E. F. Dawson, associate professor of mechanical engineering, is again a member of the speakers bureau of the American Society of Heating and Ventilating Engineers, and is a member of the society's Committee on Heat Requirements of Buildings.

E. E. Ambrosius, associate professor of mechanical engineering, is directing the A. S. M. E.—University Fluid Meters Research Project which employs twelve full time WPA workers, and because of the increased interest in meters this will be continued for some time.

The student section of the A. S. M. E., which is sponsored by C. N. Paxton and J. W. Donnell, sent a debate team to a national meeting of the Society of Automotive Engineers to meet a team from Kansas State University. The Sooner team, supporting the case of the front engine automobile against the rear engine prospects, scored a victory over some excellent competition.

Mr. Paxton, who teaches courses in aeronautics and internal combustion engines, has been working toward completion of the wind tunnel, and has worked continuously toward establishment of flying activities at the University with good prospects of success.

MECHANICS

This department also is contending with another increase in enrollment. At the end of the first week of the present semester 856 names appeared on the class rolls of members of this department, as compared to 465 in February, 1937. No new courses have been added and the instructional force has been increased by only five credit hours per week.

Several special projects are being carried on. Oil well sucker rods are being tested as rapidly as specimens can be prepared and the equipment permits. The

first report has been prepared on the effect of Bentonite on the strength of concrete and Portland Cement mortars.

The design and construction of an automatic machine for making "O. U." paper clips is in progress. Another interesting project has been the design of a mechanism to operate a football tackling dummy so that the operator may control the direction and speed of travel.

A new universal impact testing machine was added to the equipment of the materials laboratory during the last semester. This machine is arranged to test the behavior of metals when subjected to shock in bending, twisting or tension.

PETROLEUM ENGINEERING

During the first semester of this school year, a record number of sophomores, juniors and seniors were enrolled as petroleum engineers, and about seventy per cent of the freshmen engineers specified petroleum engineering as their life's profession. This school is the largest in the College of Engineering, and its graduates may be found in practically every oil field of the world.

Because of the steady increase in enrollment, two assistant professors were added to the faculty this year. They are W. C. Bednar, formerly in the employ of the Phillips and the Amerada, and G. M. Stearns, an engineer with the Empire Oil Company in Kansas. They teach several sectional classes in oil field drilling and development, and assist in laboratory courses. Mr. Bednar also teaches a class in oil field management. Mr. Stearns conducts a class on natural gas and vaporization phases as related to the production of crude oil and natural gasoline.

Wilbur F. Cloud, the major professor of petroleum production engineering, is carrying on important investigations to determine the effect of heat, pumping speed, pump submergence, and types of pumps upon oil well plunger pump efficiencies. The 500-foot experimental well at the laboratory is used by senior students to collect data.

During the last two days of February and the first two days of March of this year, the School of Petroleum Engineering sponsored a symposium dealing with the colloidal phenomena associated with mixtures of rotary drilling muds, heavy shales, oil field emulsions, corrosion of equipment, and paraffin problems in oil wells.

The school was fortunate in obtaining Dr. Ernst A. Hauser, professor of colloid chemistry at the Massachusetts Institute of Technology, to conduct this meeting.

ENGINEERING PHYSICS

As has always been the case, many students are availing themselves of the curriculum in geophysics which prepares for work in geophysical prospecting for petroleum.

Laboratory facilities have been improved during the last year by addition of

a number of instruments presented by the Western Electric Company.

The measurement of magnetic susceptibilities in fields as weak as that of the earth is being continued under the direction of Dr. William Schriever. These researches have a definite bearing upon the location of oil bearing structures.

Dr. J. Rud Nielsen, who for several years has studied the so-called Raman spectra of simple compounds in different stages of aggregation, is at present studying some of the lower aliphatic compounds in the gaseous state as well as various inorganic substances in the crystalline form. The purpose of the work is to get information about the forces that bind atoms together in molecules and crystals and also to determine the thermodynamical properties.

The School of Engineering Physics also is studying retro-directive reflectors or "reflector buttons" to make visible at night the characters of roadside signs for both safety and advertising purposes and to mark the rear ends of automobiles and trucks. Extensive study is being made by graduate students under direction of Dr. G. A. Van Lear with the objective of obtaining a basis for accurate specifications for manufacture of reflectors.

During the last year H. C. Roys has made x-ray analyses of samples of Oklahoma magnetite which are important in connection with the development of Oklahoma resources.

Last Fall Donald C. Coles, who has an M. S. degree from California Institute of Technology, joined the staff of the school as instructor in physics.

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Teacher and writer

A monthly column that she has been writing for the *Oklahoma Teacher* since 1929 is winning wide recognition for Naomi John White, '35ma, English teacher in the Muskogee public schools.

This column is now carried at intervals by teachers' magazines in nearly a score of states. She has also written articles for *Clearing House*, a journal for secondary schools, and several of these have been reprinted.

She received a scholarship for the 1937 summer session of the Writers Conference at the University of Colorado, Boulder.

Miss White is active in teachers' organizations and has served as president of the Northeastern District Classroom Teachers, president of the Muskogee Classroom Teachers Association, and as chairman of various sections of the Oklahoma Council of English Teachers. She has also served as president of the Muskogee branch of the American Association of University Women.

Miss White received her bachelor's degree from Northwestern State Teachers College, Tahlequah, and her master's degree from the University of Oklahoma.

She is attending the University this semester, working for a doctor's degree.

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