

The Engineer in National Defense

College-Trained Men Are Needed For Key Positions as Production Of Defense Material Is Rushed

AMID cries of Great Britain for fighting equipment and preparations of the United States for "total defense," the American engineer stands out as the personification of America's industrial and military power. More than ever it is the architectural engineer bending over a militaristic design, the aeronautical engineer studying airplane stress data, the civil engineer directing camp construction, or the mechanical engineer developing and testing new army ordnance that today affects the world situation in general and American national defense in particular.

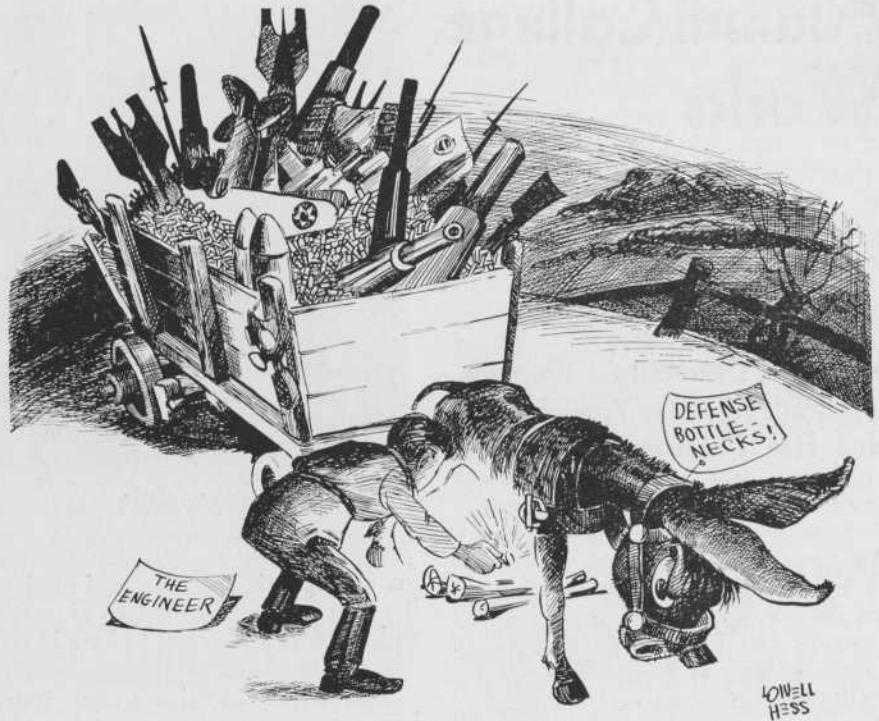
The College of Engineering of the University of Oklahoma is not far removed from the front lines of defense work. Men are leaving laboratories and classrooms for industrial or military positions. Graduates already at work are holding jobs that contribute to the nation's defense demands. O. U. is answering America's call for trained men.

According to Dean W. H. Carson, the college granted degrees to 211 engineers last year—the largest graduating class in its history. January, 1941, saw sixty-five more youths complete degree requirements. With a day-to-day change in the civilian or military status of young men, it is impossible to say how many of them are in some phase of national defense work. It is certain, however, that the percentage is large.

Perhaps the most direct contribution of the College of Engineering to defense is through the armed forces. Engineering students, like others in the University, begin their college work with the required basic military training in the Reserve Officers Training Corps. Some are enrolled in the new Naval R. O. T. C., established on the campus in 1940. The R. O. T. C. units on the campus, Field Artillery and Ordnance, are two of the largest reserve officers training units in the United States.

Although two years of basic study are all the University requires, many students take the two additional years of advanced R. O. T. C. study offered to a limited group. After completion of both the basic and advanced courses, the student may be commissioned as a second lieutenant in the reserves.

Many engineers who have gone into active military service have combined their professional training with military work and have assignments with the United



Getting Things Started!

States Army Engineers or are in the Ordnance Department of the army.

Lt. Robert E. Witt, '39ba, '39eng, is in Ordnance stationed at the U. S. Army arsenal in Metuchan, New Jersey; Jerome Wolfe, '40eng, also lieutenant in Ordnance, is stationed at St. Louis; Norman E. Schultz, '38eng, is in the Quartermaster Corps, Baltimore, Maryland.

Two O. U. civil engineering alumni who are members of the U. S. Army Engineering Corps are Lieutenants Edmund Fry, '38eng, and Perry Hackett, '34eng, both at Fort Benning, Georgia. Gordon McCraw, '40, a junior last year, now in the Ordnance Department of the Army in Springfield, Massachusetts, is working on interpretation of plans and specifications for camp layouts.

While the connection is less obvious, engineering bears close relation to naval defense. Of course there has not been time enough for the University N. R. O. T. C. trainees to get into service, but it is clear that basic engineering courses such as trigonometry, algebra, geometry, physics, and surveying, as well as the advanced courses in mechanics, strength of materials, and equipment will be direct aids to the trainees.

The work of the few alumni of the College of Engineering who are connected with the Navy Department indicates the value of engineering training in defense with "floating fortresses." Harold Wehrenberg, '37eng, for example, is senior engineering draftsman in the Navy De-

partment. Stationed at the navy yard, Mare Island, California, he plans and directs alterations on warships. George Norris, '39eng, holds a civil service position in the Navy Department, Bureau of Ships, Washington, D. C. W. Roy Nunn, '39eng, and Stuart Merwin, '37eng, civil engineering graduates, are engineers in the Bureau of Construction and Repair, Navy Department, Washington, D. C.

Newest and most rapidly expanding branches of the nation's armed forces are the United States Army and Navy Air Corps. A great many University engineering alumni are joining this phase of military service. In the College of Engineering, courses in aeronautics and the Civilian Pilot Training program are giving aviation added emphasis on the campus. An article elsewhere in this issue fully of the part the University of Oklahoma alumni are playing in American aviation.

A step removed from the defense front but of great importance nevertheless are engineers in government civil service. Aaron Alexander, '40eng, last month was sent to Louisville, Kentucky, with the status of junior civil service engineer. He will be engaged in defense construction. C. L. Holmes, '34eng, graduate in architecture, is an estimator on defense housing in the office of the chief engineer of the War Department, Washington, D. C. Another architect, Norman Floyd, '34eng, passed the civil service examination last June and is now working as draftsman

(PLEASE TURN TO PAGE 36)

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(CONTINUED FROM PAGE 11)

on the new Army training station at Ellington Field, Houston, Texas. Mark E. Miller, '36fa, is working for the third year as designer in the War Department, Washington, D. C. Keith I. Hibner, '39 eng, is an assistant architect for the Navy, working on buildings for naval bases.

Engineers employed by private firms with government construction jobs form another link in the chain of national defense activity. Wayne Dow, '38eng, civil engineer with the Benham Engineering Company, Alexandria, Louisiana, is engaged in army camp construction in the South. Several alumni are working for Brown, Bellows and Columbia Construction Company on the new naval air station at Corpus Christi, Texas. Among them are Leldon Stockton, '41eng, on surveys in construction of docks and wharfs, Walter Benson, '40eng, also in survey work, and Hiawatha Estes, '40eng, in office work.

Of importance to industry as well as directly to government defense preparations are engineering positions with firms manufacturing heavy equipment on both government and private orders. Allyn W. Hale, '37eng, is in the steel casting department of Hughes Tool Company. Arthur Rauh, '41, is craftsman and designer for the Austin Company, Houston, Texas. Ronald A. Jones, '41eng, is a welding research engineer with Dow, Inc., manufacturer of the light-weight magnesium alloy for airplane construction.

Most of the men in this phase of national defense industry have taken their college training in mechanical or general engineering. These schools in the University also furnish a high percentage of the O. U. engineers who go into active military service, especially into Ordnance. An addition to the curriculum of general engineering has been made in view of today's industrial complexities: metallurgy and materials of engineering, dealing with the constitution, properties and manufacture of materials used in all kinds of construction.

Chemical warfare in the present conflagration has remained in the background. Thus chemical engineers in the United States are not in the limelight with death-dealing chemical preparations. Their efforts are being applied in pursuits farther from actual combat but perhaps more important in the long run. Some of the fields in which they are engaged are the manufacture of explosives, dyes, paints, and the improving of motor fuels.

The petroleum engineer finds the oil and brings it to the surface. The chemical engineer then takes over to carry the crude through refining and processing for use in motors. With motors commanding a more important part in military organi-

zations than they ever have in the history of the world, research in motor fuels is being pressed.

There, too, O. U. is contributing. Such men as W. C. Patterson, '35eng, refinery engineer for the Texas Company, Port Arthur, Texas, R. A. King, '35eng, Phillips Petroleum Company refinery, Borger, Texas, and Earl Bartholomew, '21ba, '22 eng, '23ms, executive engineer, Ethyl Gasoline Corporation of New York, are constantly engaged in research directed toward improvement of motor fuels, especially those used in high compression engines of which the airplane engine is the most important.

Two chemical engineering graduate projects on the campus might reveal facts consequential to national defense. The first concerns heat transfer studies in finned tubes used in air cooling systems of various types of engines. The other is directed toward obtaining the pressure, volume and temperature measurements on gases and oils from high pressure oil fields.

Thus far in this discussion attention has been given to results in national defense of training offered in the College of Engineering as a regular part of the college's work. But this is only part of the picture. Government-sponsored courses conducted by the faculty of the college enlarge O. U.'s part in the national preparedness program.

R. V. James, head of the Department of Mechanics, is institutional director of the special engineering defense training courses.

Early in June, 1940, the College of Engineering received from the United States Department of Education a request for a detailed report of the shop facilities which the college could use for training mechanics for specialized work in national defense industries. A special committee with Dr. R. A. Hardin, assistant professor of industrial education, as chairman submitted a report to President W. B. Bizzell who in turn submitted it to John W. Studebaker, U. S. Commissioner of Education. The report was approved and government financial assistance was assured as soon as funds could be appropriated.

It became apparent that considerable time would elapse before the government program would be started, so the committee decided to organize an aircraft welding short course of four to six weeks, financed by payment of fees. The courses having been announced, William T. Tiffin, instructor in mechanical engineering, director of the course, was swamped with more than seven hundred applications. And even before instruction had started, personnel directors of airplane manufacturing companies were inquiring about the possibilities of employing trainees.

On July 22, 1940, thirty men began the course. Due to the increased demand for the course, it was decided to expand the

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welding facilities to take care of seventy-five trainees per course. Since July 22 enrollees have numbered 390. More than 270 of these men completed the work and received certificates from the University. Of the number who finished, about sixty percent are already employed in aircraft plants.

Modern equipment valued at more than \$7,000, permanent laboratory equipment of the University, is being used in the welding courses. It includes six electric welding stations and thirty-five oxy-acetylene welding stations.

There are no requirements as to skill, ability, or academic standing for either of the two courses—arc welding or oxy-acetylene welding. An applicant does not have to be enrolled in the University.

Time necessary for the course varies with the individual. Trainees must satisfactorily complete certain assigned projects. Then they are given the Army Corps qualification test, the same test as that given all prospective employees in aircraft plants. Average number of hours required by the 270 men who completed the course was 160.

The Department of Architectural Design of the School of Architecture has been participating since last September in a special program sponsored by the Beaux Arts Institute of Design of New York concerning theoretical architectural defense problems. Design of an R. O. T. C. summer camp for 320 young officers was the first project given to the junior class. It called for eighty tents with adjoining wash-room facilities as well as headquarters building with classrooms, recreation rooms, mess hall, and officers' living quarters. The class is at work now on plans for an army emergency hospital to be located next to a munitions factory.

Lt. Col. Paul V. Kane of the University R. O. T. C. unit has been collaborating with the School of Architecture in working out solutions for both assignments. Such work, he commented, is excellent training for possible future work in the Quartermaster Corps office.

For the senior class the first problem was an airplane base in the Pacific Ocean. Another was the design of a canal lock station.

In collaboration with the United States Office of Education the University is offering two special defense courses for training engineering draftsmen. They are conducted at the University during the day and at Oklahoma City Junior College at night, three hours a day for twenty-five weeks.

Twenty-seven are enrolled in the University section and ninety in the night course at Oklahoma City. Work offered is equivalent to four semesters of drawing and eight credit hours in mathematics and shop processes. It is open to high school graduates. Most of the students, however, have had one or more years of college study.

Both courses prepare men to enter industry with a rating similar to the civil service rating of junior draftsmen.

Also supported by government funds allocated for an industrial training program is the University machinist short course. Under the direction of Dr. Hardin, it began August 26, 1940, to train lathe operators, milling machine operators, drill press operators, tool and cutter grinders. It is an eight to twelve weeks course requiring attendance of eight hours a day. At the completion of the course the trained men receive a short course certificate and the College of Engineering helps to place them in industry. At the present time the demand on the University for men trained in shop work far exceeds the supply, officials of the college report.

Trainees for this and similar courses must be selected from the rolls of the Work Progress Administration of the federal government and the Oklahoma State Employment Service.

Halliburton Oil Well Cementing Company, Duncan, Oklahoma, has co-operated with the University on this program by loaning the company's outstanding machinist, Frank Bynum, to instruct a section of the course.

Projects built in the shop by the trainees are similar to work they will do in future jobs. Construction under way now includes drill presses, a centrifuge for the School of Chemical Engineering, a one-hundred-ton hydraulic press for the shop department and a steel shaper.

Commendable results of the work have already appeared. Upon completion of the training recently, three men were employed by the North American Aircraft Company in Dallas. They have all received substantial raises during their short time there and one of them has been advanced to position of assistant foreman in one of the company's machine shops.

American engineering skill is the backbone of the nation's—and the hemisphere's—defense, and the University of Oklahoma's College of Engineering is doing its part toward developing that skill.



MEFFERT-HOWES: Miss Louise Meffert, '40fa, and Bernard Philip Howes were married in December at Hugo. She is a member of Alpha Chi Omega sorority and is employed as music director at the Bennington school. Mr. Howes is second lieutenant in the 179th Infantry at Fort Sill.

Dr. Clyde H. O'Dell, '40, who has been doing graduate work in education at the University for the last few years, has been appointed superintendent of schools at Claremore. He fills a vacancy created by the death of C. P. Crudup. Dr. O'Dell has degrees from Southeastern Kansas Teachers College, the University of Missouri, and Colorado State Teachers College.

ORTMAN-DAULTON: Miss Roberta Ernestine Ortmann, '40, and Charles Newell Daulton were married November 28. He received his education at technological schools and is now employed at the Stearman Aircraft Company in Wichita, Kansas, where they will make their home.

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Football

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1941 Schedule

September 27 (Tentative)	Oklahoma Aggies at Norman
October 11	Texas at Dallas
October 18	Kansas State at Manhattan
October 25	Santa Clara at Norman
November 1	Kansas at Norman
November 8	Iowa State at Norman
November 15	Missouri at Columbia
November 22	Marquette at Norman
November 29	Nebraska at Lincoln

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