



Two industrial research projects now under way at the University are illustrated above. On the left is spectrograph equipment used for experiments on the identification and measurement of minute quantities of hydrocarbons, a project that may lead to new methods of oil exploration and analysis of hydrocarbon mixtures. On the right, specially built equipment for examining the performance of reflector buttons and working out a basis for commercial specifications for reflectors

Research for Oklahoma Industries

By HOMER L. DODGE

DEAN OF THE GRADUATE SCHOOL

Institute Plan To Bring Closer Co-operation With State's Industrial Firms

THE University of Oklahoma has now completed plans by which it may serve more effectively the industrial and social needs of the State. At its January meeting the Board of Regents gave final approval to the organization of the University of Oklahoma Research Institute.

Although the Institute will be a separate corporation, it is so constituted that the major portion of its work will be carried out as an integral part of the research and educational program of the Graduate School. For the first time the State and its largest research center are thus brought into practical, active co-operation. The results should be of incalculable benefit to Oklahoma as a whole as well as to the businesses and research workers immediately concerned.

This is the first research institute to be established in the Southwest; but the general plan is not new, for several such institutes or foundations have been in successful operation at other institutions—notably the University of Wisconsin, Purdue University, and Ohio State University. In the organization of our institute it has been possible to profit by their experience.

Research institutes are the means by which universities make their research programs serve the needs of their regions. They operate in the same way that the research departments of large corporations serve those organizations. Industrial research is one of the striking developments of our age. Future historians are indeed likely to characterize the beginning of the Twentieth Century not only as a period of great wars but also as the period when one of the most hopeful and constructive forces of all history was evolved—the method for organized and planned exploration, discovery and invention. The telephone, radio, movie, automobile and airplane industries are based on the application of modern science. All of these industries expend large funds for exploration of the unknown, usually called pure or fundamental research, as well as for developing means by which new knowledge can be applied in a practical way, commonly called development or applied research. Just so, social problems arising out of this sudden emergence of the new inventions on which these industries are based must also be solved by the application of methods of research appropriate to the social sciences.

This method of applying research to the solution of problems had its origin in the colleges and universities. Here the men who have brought about these changes in industrial methods received their training in the scientific approach to problems. It is natural, then, that there should develop

a desire to make universities more immediately responsive to the needs of their regions through closer integration of their work with that of commercial, industrial, social and governmental agencies

This can be accomplished not by having universities neglect their unique obligations to push forward the borders of knowledge but by speeding up and facilitating the processes by which such knowledge finds practical expression through supplementing the traditional research program by additional applied research.

Other universities furnish numerous examples of significant contributions of this kind. At the University of Wisconsin the Alumni Research Foundation had its start in the Steinbock patents covering the production of antirachitic properties in foods by irradiation with ultra-violet light. These patents, through the careful supervision of the Foundation, have resulted in enormous benefits to mankind. At the same time they have been unusually successful financially and have resulted in a large endowment for the support of research. At Purdue University many projects of value to various industries have been worked out, including an outstanding contribution in the field of television. At Ohio State University the Research Foundation has made available to the State the research services of nearly a score of departments. In many instances the co-operation of several departments on a single project has been found

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necessary. Paint research leads into chemistry, physics, and even entomology. Ceramic research, especially important to Ohio, covers a range of application from fire walls to artificial teeth. Here, the American Petroleum Institute is supporting an extensive research in hydrocarbon chemistry. There is scarcely any limit to the range of fields of learning which may be drawn upon for service to the various interests of a state which can profit from research.

Since research is expensive, it is fortunate that much of the research of an institute is of a nature such that industry is glad to support it by financing fellowships and special equipment. Mr. Harold Vagtborg, director of the Armour Research Foundation, in a recent address emphasizes the fact that, except for a few striking exceptions, industry is reluctant to carry on any large amount of fundamental research and has looked to endowed and tax supported institutions to carry the brunt of such expense. He says that educators may rightfully question such a policy:

"Most of the fundamental research work will undoubtedly always be done in our educational institutions, with industry becoming inclined to support more and more of its cost and at the same time being increasingly willing to support almost the entire cost of applied research. We find that industry is almost wholly dependent upon the new discoveries made in fundamental research and that the fruits of research in our educational institutions contribute in a major way to industrial progress. Sponsorship of both fundamental and applied research, therefore, must be continued at an ever increasing rate, for, without new discoveries coming regularly, applied research will stagnate and the benefits of research progress to mankind will wane."

A properly planned program of institute research thus supplements the normal research activities of industry. At the same time it makes possible a much broader and more effective program of research and study in the university's graduate school.

The annual report of one institute shows that during a recent year fifty-six members of the faculty participated in sponsored research activities by directing various research projects. From this work they received the benefits of enlarged research activities in fields of their particular interests and were brought abreast of the latest developments in their respective fields. At the same time 140 students participated in the research work. For a number of them the income received from the fellowships was essential to their

remaining in school. In addition to the benefits gained through learning research procedure, and gaining information and experience supplementing the regular work in the classroom and laboratory, these industrial fellows came in close contact with industrial executives and became familiar with the methods and needs of industry even before leaving the University. In this way the transition from a university atmosphere to industry is facilitated, eliminating the period of adjustment so frequently needed for graduates whose training has been strictly on an academic plane.

Another important result of such sponsored fellowships in Oklahoma will be that they will serve to hold in the state the most talented of our students; for, as time goes on, these students should find their greatest opportunity in Oklahoma industries rather than in the large Eastern corporations to which so many of our most promising graduates now go.

It is to be hoped that the Institute will be of special help to small Oklahoma industries that are not now in a position to establish research departments of their own but will be able to sponsor research projects of value to them that eventually should be the source of new employment.

Although emphasis has been laid so far upon industrial research, it should be made clear that the program of the University of Oklahoma Research Institute will not be restricted by any requirements except that the research must be for the interests of the State and operate as a normal and integral part of University activities. In broader terms, the purposes of the Institute will be the conservation and development of the natural, industrial, and human resources of Oklahoma through research. There are other agencies already working for the same general ends and it is to be hoped that there will be more. It is not the purpose of the new organization to take the place of any of these but to work with them and through them by furnishing the peculiar type of co-operation and service which it can provide. In this way the research facilities of the University of Oklahoma will be made available to any organization, public or private, working for the betterment of the State.

The plan for the Institute is the product of the thinking of many persons affiliated with the University. The general conception was presented to President Bizzell about a year ago. At that time he asked that a thorough study of similar organizations be made. As a result of this study a sketch of the general plan was presented to the Board of Regents at its meeting in June, 1940, and given tentative approval.

During the fall, John Rogers, of Tulsa, and Maurice Merrill, professor of law, rendered valuable assistance in formulating final plans. In the meantime Joseph A. Brandt was elected next president of the University. When the plans were be-

ing put in shape for final consideration of the Board of Regents, it developed that President-Elect Brandt had been at work on similar ideas. When he met with the Board at the January meeting, he lent his enthusiastic support to the proposal for the Institute, characterizing it as one of the most constructive steps the University could take. As finally adopted, the plan contained several changes made at his suggestion, serving to broaden fields in which the University might serve.

The membership of the Institute will be composed of groups of councillors representative of various interests. All members of the Board of Regents and certain representatives of the administrative staff and faculty of the University will be councillors. There will also be an alumni group and groups representing industry, commerce, farming and stock raising. Another group will be made up of intellectual leaders of the state, interested in all things that serve to promote general social welfare. From the councillors there will be elected a Board of Directors of twenty-three persons with an Executive Committee of seven.

With the Institute so definitely a part of the University organization and working almost completely through the University the question comes up as to why a separate organization is necessary. There are several reasons for this. One is that experience has shown that a university organization is not adapted to handle the various types of complicated relationships that exist, especially when patents are involved. An institute provides a means by which these relationships can be worked out. All that the University will have to do is to enter into a simple contract with the Institute covering the support of fellowships, the use of University space and equipment not needed for other work, and the use of additional special equipment purchased by the Institute from funds furnished by the co-operating agency. The Institute, in its turn, will enter into contracts with the co-operator, involving licenses, royalties, etc. in the case of patentable devices or products.

The Institute will begin its work without funds. It has been thought best to provide for a perfectly natural growth by not encumbering it with financial commitments and obligations at the start. For this reason, and because its work must be intimately associated with graduate study and research, the burden of administration, at least for some time, will be carried by the Graduate School office.

As sponsored projects are undertaken and eventually prove successful in their commercial applications, there will be two sources of income for the Institute. First, there will be the payments from sponsors covering the cost of fellowships, apparatus, and operating expenses of their particular research projects. These funds will be immediately expended in projects that will enlarge the University's research

program, as well as help the sponsors. The second source of funds will be from fees, royalties, licenses, etc. These will constitute free funds which will be used for Institute research in the public interest or turned over to the research committee of the University for assignment through the regular University channels. It is hoped that sufficient funds will eventually be available through royalties and license fees so that an enlarged program of research in all fields will be directly supported by Institute funds or indirectly by the release of the regular University research funds into channels that might otherwise be neglected.

The policy of the Institute will be to recognize that there are no limits to the range of research activity that may be of vital importance to the State. It happens that the flow of dollars is from the channels of commerce and industry; but this flow, while stemming from these sources, must find its way to any field of research that is of value to the citizenry of the State. With the Institute operating on this broad conception of its obligations to the State, the taxpayer will be repaid many times over for the contribution which the University makes to the success of the individual research projects.

It is of interest that the need for the Institute became pressingly evident just as the first tentative plans were nearing completion. Projects involving five fellowships, necessarily conducted on an informal and temporary relationship, have been waiting for the creation of the Institute to be properly set up. These will become the first projects under the new organization.

The story of these projects illustrates a type of research that may be undertaken through the Institute. Last spring Mr. Erle Halliburton, president of the Halliburton Oil-Well Cementing Company, realized that it should be possible to put to practical use in the oil industry the knowledge of the field of spectroscopy which Dr. J. Rud Nielsen has developed during the past fifteen years of intensive research. Negotiations with the University resulted in a fellowship, the most generous which the University has ever had. This work has been in progress since May with such marked success that Mr. Halliburton is inaugurating a second fellowship. At the same time Mr. Robert E. Lee, of the Reynolds-Lee Engineering Service Company of Dallas, established a similar fellowship and furnished funds for the purchase of elaborate equipment for infrared spectroscopic research. Another industrial research project which has been going on for two or three years on the present informal basis deals with the study of the "reflector buttons" used on various types of highway signs. Dr. George Van Lear, one of the leading authorities in this field, has done more than any other individual to clear up the many intricate scientific problems connected with these

apparently simple devices. This project has already resulted in an important scientific paper and recently an instrument for examining the performance of such reflectors.

From now on the progress of this effort toward planned co-operation between the University and the public in building a better State will depend upon the vision of the individuals concerned and the available facilities. While the University has many faculty members who are capable of making important contributions through research, they are severely limited in available time and even more in space and equipment. There is scarcely a department of the University which is able to take care of the needs of its mere teaching obligations. Without time and facilities no large program of research can ever be undertaken. Growth of the Institute will therefore have to be gradual. As the plan demonstrates its success, sponsors will come forward with funds for the support of new projects. But it must be recognized that there will be no way in which the projects can be undertaken unless there is laboratory and other working space for the fellowship students engaged in the research.

In the very nature of the situation this space cannot be furnished by the sponsoring organizations. In fact, it is the principal contribution made by the University in return for the enriched educational program, supported by the outside sponsors. Those interested in the success of the Institute must therefore realize that adequate space cannot now be furnished for such work. Only when this situation is improved will it be possible to realize fully upon the rich potentialities for the improvement of the general welfare of the State inherent in the plan.

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Ted Green, '40eng, and Mrs. Green announce the birth December 27 of a son, Theodore Steven, Jr. They live in Jonesville, Louisiana.

Leonard A. Kratzer, '40eng, Tulsa, second lieutenant in the Reserve Corps, has been ordered to active duty with ordnance companies at Fort Bliss, Texas.

Fred LaRue, '21law, and Ira (Eph) Monroe, '40law, have announced a law partnership at Clinton effective January 1. Mr. LaRue is former county attorney of Custer County and for a time was district director of W.P.A. work for the Hobart area. Mr. Monroe, who was an outstanding baseball player at O. U., has been practicing law in Clinton since last September.

Jay Smith Lee, '40, expects to receive an air corps commission at Kelly Field in March, and has been recommended as a flight instructor at Randolph Field. He had never ridden in a plane before he entered the Spartan School of Flying at Tulsa early last June.

McCONNELL-LEWIS: Miss Marguerite McConnell and Terry Lewis, '40eng, were married in December in Chickasha. They live in Hebronville, Texas, where he is employed by the Halliburton Oil Well Cementing Company.

McKOY-RAMSEY: Miss Zebalene McKoy, '40, and Neuman Everett Ramsey, '39ed.m, were married December 24 in Ada. She is a member of Chi Omega sorority. They live in Bridgeport, Connecticut, where he is an accountant for the General Electric Company.

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