PRESIDENT'S ADDRESS

THE OKLAHOMA ACADEMY OF SCIENCE AND EDUCATION TODAY

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LADIES AND GENTLEMEN:

It is indeed a pleasure and honor to appear before you this afternoon. I have had a most enjoyable year as your president, and at this time, I want to express my appreciation for the assistance of my fellow officers in the Executive Council. Each one of them has served efficiently and wholeheartedly and their unanimous assistance has made my duty simple and enjoyable. Thank you, gentlemen!

Last fall when the nominating committee read my name as your nominee for president, the one question that came to my mind and kept bothering me was, "What will you talk about next fall when you sing your swan song?" This question has haunted me for the entire year and I am not altogether sure that I have a satisfactory answer, even yet.

In order to ascertain a little better just what might be expected of a presidential address before this organization, I consulted the titles of the previous addresses and read several of the papers. I found that they could be placed into three general classes: one, those dealing with some special field of interest or research in which the author was working; two, those topics of a broad general or philosophic nature; and three, those dealing specifically with the work of the Academy itself.

During the last few months, different events in the educational program of the state and within our own institution have caused me to ask myself many questions as to the *where*, *why*, and *how* of education in Oklahoma and the United States. Because of this recent contact with the general problem of education and my feeling that it is a moot topic to all of us—I have selected as my subject, "The Oklahoma Academy of Science and Education Today."

The Oklahoma Academy of Science had its origin in Oklahoma City, December 30 and 31, 1909. Some twenty-one persons representing fourteen different communities were present. Ten papers were read and a membership list of forty-five names was approved. H. H. Lane, now of the University of Kansas, was elected the first president. In 1910, the Academy met at the University of Oklahoma, Norman, and in 1911, thirty years ago this week, the Academy met on this campus. We are indeed happy to welcome you back.

During these thirty years, many changes have occurred both in Oklahoma and in the Academy. Because of the war conditions, the Academy did not hold meetings in 1914, 1918, and 1919. In 1915, 1916, 1917, and 1920, the meetings were held in conjunction with the Science Section of the Oklahoma Education Association. In 1916, the Academy was chartered by the Secretary of State, and in 1921 it became affiliated with the American Association for the Advancement of Science.

Today, 1941, we find the Academy with a membership roll of some 456 members and a program of 116 papers. At first glance, this seems a most phenomenal growth, but when we consider the increase in the population of the state and the large number of eligible persons who are not represented, the membership is distressingly small. It is hoped that the incoming officers will be able in some way to overcome this difficulty.

Perhaps it would not be amiss to present at this time the purposes of this organization as stated in the Constitution, Article I, Section 2:

> "The purpose of this Academy shall be to stimulate scientific research; to promote fraternal relationship among those engaged in scientific work in Oklahoma; to diffuse among the citizens of the state a knowledge of the various departments of science; to investigate and make known the material, educational and other resources of the state; and to publish such reports, papers, or discussions as may embody the purpose of this Academy."

In order to carry out these functions, the Academy holds two meetings each year. The annual business meeting, held the Friday and Saturday of the week following Thanksgiving, provides opportunities for the reporting and discussion of research work under way in the various institutions of the state. Social activities, such as this luncheon, provide occasion for fraternal acquaintance and discussion among those whose duties and interests would not otherwise bring them together. The publication of the *Proceedings* makes available to all, the results of the research conducted within the state and provides a means of acquainting the public with the various fields of scientific endeavor. The annual speaker and other special numbers provide a means of information and stimulation.

The spring meeting is usually held in April and is an outdoor or field meeting. Its prime function is to acquaint the members of the Academy with the geology, fauna, flora, and natural resources of the state.

In addition to these traditional programs, the Academy has, in the last few years, undertaken to assist the high school science teachers of the state through a special committee known as the High School Relations Committee. Small amounts of money have been appropriated from the limited resources to assist the Junior Academy and recently, with the assistance of the Works Progress Administration and the University Museum, collections of various sorts are being compiled and prepared to be sent out as teaching aids.

Scientific research has been encouraged in a very material fashion by the assignment of specific funds to be given to research projects needing financial assistance.

It is to be hoped that the suggestions advanced at the business meeting this morning, in regard to ways of increasing the financial resources of the Academy, will bear fruit. With additional funds, this organization could increase its services to the State of Oklahoma in a great many ways. Especially do I hope that the publication facilities may be expanded and made more usable to our members.

I come now to the second portion of my topic—"Education Today." That this is a timely subject can be illustrated by the following Christmas card which I received a year or two ago.

"If you will read carefully the following editorial appearing in Harper's Weekly, one of the nation's leading periodicals, it will help you have a MERRY CHRISTMAS.

"It is a gloomy moment in history. Not for many years—not in the lifetime of most men who read this paper—has there been so much grave and deep apprehension; never has the future seemed so incalculable as at this time.

"In our own country there is universal commercial prostration and panic, and thousands of our poorest fellow citizens are turned out against the approaching winter without employment, and without the prospect of it.

"In France the political caldron seeths and bubbles with uncertainty; Russia hangs, as usual, like a cloud, dark and silent, upon the horizon of Europe; while all the energies, resources and influences of the British Empire are sorely tried, and are yet to be tried more sorely, in coping with the vast and deadly Indian insurrection, and with its disturbed relations in China.

"It is a solemn moment, and no man can feel an indifference (which, happily, no man pretends to feel) in the issue of events. Of our own troubles no man can see the end. They are fortunately, as yet, mainly commercial; and if we are only to lose money, and by painful poverty to be taught wisdom—the wisdom of honor, of faith, of sympathy and of charity—no man needs seriously to despair.

"And yet the very haste to be rich, which is the occasion of this widespread calamity, has also tended to destroy the moral forces, with which we are to resist and subdue the calamity.

"The above sounds natural, yet you will smile to know that it is taken word for word from an editorial appearing in Harper's Weekly on October 10, 1857."

Evidently most of our problems today are *timely* or *time worn* problems. At any rate an attempted survey of the problems facing educators will not do any harm, even though it may not provide any satisfactory solution.

In undertaking this analysis we might ask ourselves—What is the function of Education in a Community?

Dr. O. F. Curtis of Cornell University expresses it as follows:

"The training of a person, if he is to be considered as broadly educated, should be such as to give him understanding of himself, of the society in which he lives and his responsibilities in that society, of the world about him and of his relationship to that world. It should give a foundation for further advancement and an ability to appreciate values, to distinguish between true and false reasoning, and to evaluate evidence . . . . . It should prepare him to live with satisfaction in the present world, to meet without panic and without prejudice various problems as they arise; and he should be able not only to grow with, but also to help in improving, a growing world and a changing civilization."

The National Education Association says that "the function of Education is to train the individual to do better that which he is going to do anyway."

Herbert Spencer expresses it—"To prepare us for complete living is the function of Education."

Recently I have heard three prominent speakers express a view with which I cannot completely agree. They stated that "Education is successful only to the extent that it makes the individual dissatisfied with his environment." They seemed to feel that anything which creates or stimulates desires, appetites or wants that make man dissatisfied with the "status quo" must be considered as educational. I am not sure that they would consider "Esquire" a good educational textbook, but it at least presents a different environment from that in which most of us live. If dissatisfaction with what we have and where we are is the true goal of education, then most educators should major in advertising and salesmanship rather than in pedagogy. Perhaps, at that, the movies, radios and newspapers are more effective than our schools.

It should not be necessary to point out that there is a growing dissatisfaction on the part of many people with the results of our present educational system. W. G. Land expresses a sentiment found frequently in our editorials and commentaries when he says:

> "If the colleges, to say nothing of the schools, had been teaching their graduates to seek true facts, to face them fairly, and to act with the courage of their convictions, this country with its thousands and thousands of college graduates would long ago have ceased to be in the position of 'muddling through' ".

As always, most of the critics are not certain just what is wrong but they feel that a change is necessary and inevitable. It is customary in time of stress and emergency for the old question of vocational training to come to the fore. For example, we have developing today a competition between the N. Y. A. and the C. C. C. with their vocational training projects, and the regular established school systems.

Both students and patrons express the feeling of dissatisfaction when they ask: What can he do now that he is graduated from high school or college? Should not his training enable him to find employment? One high school student expressed it somewhat in this fashion:

> "When I graduate, I would like to be able to go to an employer and say: 'I have certain abilities along these lines which I wish to offer for sale. Can you use them?' But will I be able to do this? Specifically, just what talents will my training in school develop? How will four years in college make me of greater value to a prospective employer?"

Someone has said that "the statement made by many college graduates that they got more out of extra-curricular activities than they did out of class is one of the most damning criticisms of higher education ever voiced."

That such criticism will increase is inevitable as the expense of our defense program pinches harder and harder. It is already expressed in the attitude of the public toward appropriations for state schools and in their donations to private institutions. The endowed colleges are frankly facing grave financial peril while the state supported institutions have had their resources drastically slashed.

There are many problems to be solved. In the early establishment of our nation, it was assumed that one of the obligations of the state was to provide the fundamentals of an education to everyone capable of utilizing the same. These fundamentals were considered to be the three R's. Train-

ing in these fundamentals was given, during the winter months, when the child's labor was not profitable elsewhere. Gradually, as our population increased, civilization became more complex and machine power replaced man power. There was less and less demand for the labor of children and society required more and more of the school room. As a result, the state assumed the obligation of giving to every child not just skill in the tool subjects of reading, writing, and arithmetic, but complete training through the eight years of elementary school. Then it became apparent that every child was entitled to a high school education. And today, in many states, free college training, even to the professional schools of law, medicine, etc., is taken for granted.

Such a program of universal education is considered by many to be basic to our present American Way of Life, but it involves many difficulties. In the first place, we as educators must remember that the school is for the benefit of the child as a citizen, not us as teachers. Second, we must remember that such a system is tax-supported and that these children are the only children the taxpayers have, regardless of whether they are capable of utilizing what we have to offer or not. In other words, our educational system must be geared to the material with which we have to deal if it is to be universal.

Any commercial institution to succeed must meet the conditions and the demands of the times. Its products must be useful to the public and improvements must constantly be made. So it is with the school. Universities have flourished when their teachings were relevant to the times, but they have withered and died when they clung to outworn disciplines and traditions.

If the principle of universal education, at state expense, is to be extended to the college level and the professional school, then our traditional college program is going to require a drastic revision. Two problems must first be solved. Is this "universal" education to be available, at college level, only to those capable of absorbing it? If so, what is to be our measuring stick for the power of absorption? Second, if a college education is to be the goal of every youth, regardless of ability as now seems to be the case, then we are faced with the same basic problems that face the elementary schools; i. e., education on a mass production basis versus the adjustment of the subject matter to meet the requirements of the individual. Mass production economy in education does not meet the needs of the individual person or community. A satisfactory compromise must of necessity be found.

Regardless of how we solve the problem of universal education, we still must face the age-old controversy of vocational specialization versus general education.

Rousseau has said—

> "Whoever is well educated to discharge the duty of a man, cannot be badly prepared to fill any of those offices that have relation to him. It matters little to me whether my pupils be designed for the army, the pulpit or the bar. Nature has destined us to the offices of human life, antecedent to our destination concerning society. To live is the profession I would teach him. When I have done with him, it is true he will be neither a soldier, a lawyer, nor a divine. Let

him first be a man. Fortune may remove him from one rank to another as she pleases; he will be always found in his place."

But the advocate of a vocational education replies, "How and where is he to learn to be a soldier, a lawyer, or a divine? If not in school, then where and how?" Does this mean that we can justify specific vocational training at public expense over and above the program provided in our Liberal Arts Colleges? We are doing this in such professions as law, medicine, engineering, pharmacy, and pedagogy within our own state now. What about the other professions and vocations in which specialized training is of great value? Should the state differentiate the fields in which it will or will not provide training? Is the state obligated to furnish vocational training to all or is such training to be available only to those who are financially able to pay for it? Society needs these trained individuals. How is their training to be financed, by the state, by their parents, or out of their future earnings?

What about those vocations in which specific training is of great value but which do not require the broad general foundations necessary in the professions? Are industry and business not justified in expecting at least partially trained employees to be provided by an educational program for which they are asked to pay?

The U. S. Office of Education, using data published in 1937, estimates that about one million individuals graduate from high school in the U. S. each year. Approximately one-third of these enter college. At least half of those who enter college fail to graduate. What provision does our educational system make for the vocational needs of those who do not graduate from college or high school?

These are questions which the school administrators are facing constantly. Perhaps the solution for these problems will come through a more exacting study of the possibilities in vocational guidance programs. It would seem highly probable that we can definitely isolate a few tool subjects which are basically necessary to all vocations. A training program in the elementary grades could then be built around these. Special vocational courses, at high school and junior college level, are in demand under our present system, and it might be possible to classify the vocational fields and provide basic programs in tool subjects adapted to the broad vocational areas just as we now do in law and medicine. At any rate, we can help in determining those who are most likely to succeed in certain vocations by the use and development of Vocational Guidance Aptitude Tests and other such devices. Research in these fields seems to me the most promising way of solving the perennial problems of vocational training. We need first to determine what educational procedure or curriculum is the best preparation for a vocation before we can give proper training in that vocation.

I have spent considerable time this afternoon presenting questions and criticisms which seemingly have no answer, but I have at hand some reports on attempts which have been made to evaluate our educational program. Some of the conclusions as well as the methods of obtaining data are worthy of our attention.

In the first study (Hamilton 1941), some 3,167 seniors in 103 high schools were observed and catalogued according to various conditions. Of

these, 1,547 were followed into some 40 colleges and universities; 1,281 were studied through the freshman year, and 826 into the sophomore year. Boys only were observed. The purpose of the study was to determine what factors influenced the transition from high school to college. Success was defined as "satisfactory performance" in ten areas: (1) health, (2) scholarship, (3) finance, (4) family and home, (5) religion, (6) morals and discipline, (7) personality, (8) social relations, (9) living conditions, and (10) outreach.

Many interesting conclusions were drawn but these seem paramount. "Given the intelligence necessary to understand their studies and the health and vigor needed for hard work, all the other traits which students need for successful transition can be acquired." "The school should teach the students how to study." Schools have all sorts of tests for determining causes of failure but there has been little or no provision made for remedial work. They should show students how to take notes, use the library, etc., not just give them low grades for not knowing how to do these things. "Schools do not yet expect enough of their students."

Another study entitled "How Good are Our Colleges?" is based on data obtained by the Carnegie Foundation for the Advancement of Teaching and deals with the colleges of Pennsylvania during 1928, 1930, and 1932. The criterion of evaluation was the intellectual mastery of important areas of knowledge. It was assumed that standardized, objective tests were the best means of determining a student's knowledge of a given subject. It was also taken for granted that the main function of a college is to increase a student's "stock of mature and available knowledge" and that if this is well done, the other values of a college education will be absorbed.

The tests were supposed to measure such things as mental quickness, accurate information about a wide variety of facts, and perhaps, general culture. The results did not agree any too well with the grades given in school. However, 85% of the students improved their scores between their sophomore and senior years. This would indicate that the tests measured, to some degree at least, what the colleges were doing.

One-fourth of the college students showed less academic ability than the average of those who left school and went to work. If the tests were reliable, and students of the highest academic ability should go to college, then the colleges are now getting only about half of the high school graduates they should. The other half are going directly into jobs. Fifty per cent of those in college are not entitled to be there on the basis of ability.

That there are definite variations in the products of different colleges was shown by the fact that when students of equal ability, as high school seniors, went to different colleges they differed greatly in their achievement at graduation time. Pupils in the poorer (scholastically) institutions were about as far advanced at the end of four years as those in the best institutions were at the end of two years. In frequent cases, it was found that high school seniors and college sophomores were further advanced than college seniors. Time was therefore concluded to be a poor measure for use in granting a college degree. The study recommends that the standards for granting diplomas be based on achievement instead of on the length of time served.

It was interesting to observe that the intelligence test scores of prospective teachers were below the average for all college sophomores. However, other studies indicated very little relationship between academic scholarship and teaching success.

The evidence would seem to demonstrate that the method of selection of students by the college determines to some extent the quality of work done in that college. Those colleges with high entrance requirements maintained an atmosphere which seemed to stimulate the development of the student more than did that of the "low" college with little or no entrance requirements.

Perhaps the most interesting point of all, however, was the great variation found in the ability or achievement of the graduates of both high schools and colleges, etc. Yet all of them were exposed to the same educational program. Can we successfully provide for individual differences in a mass production program of education?

The third study was based on the Report of the Regents' Inquiry into the character and cost of public education of the state of New York. It was estimated that nearly one-half of the unemployed persons in the U. S. were young people just a few years out of school. Five and one-half million of them were between the ages of 16 and 24. Specific vocational training was found to play only a minor part in obtaining jobs, and the kinds of jobs which the young people obtained bore only the crudest relation to the nature of their scholastic training. The Regents recommended that students spend less time in school getting training for special jobs and more on acquiring basic scientific and economic training. This would seem to answer, to some extent at least, the charges of the Vocational Training enthusiast.

The survey indicated that neither the colleges nor high schools of New York state were designed to meet the needs of all kinds of youth. It was felt that pupil attitudes were decidedly unsatisfactory. For example: five out of six students voted "no" on such questions as, "Should a student volunteer to help clean off the school yard during lunch hour?" and "Should a business man accept a nomination for mayor if loss to business and social interests is involved?" The general attitude seemed to be "Let George do it."

Most students on leaving school were found to have ceased activities generally considered as educational, such as reading news magazines or listening to educational radio programs, etc.

On the basis of the facts obtained, it was recommended: that children be started to school at four and one-half to five years of age; that the basic tool subjects—reading, writing, speech, and arithmetic—be mastered by the end of the sixth grade; that the greater part of the time up to the end of the twelfth grade be devoted to such studies as general science, human relations, community life, world history, general mathematics, and the cultivation of the basic skills, reading and writing; that character education and understanding and enthusiasm for the democratic system be made the central purpose of the school's activity program; that students be required to remain in school until 16 years of age and until 18 unless they are gainfully employed, even though this means extending the high school course beyond the twelfth grade.

It was also recommended that teachers be selected by competitive tests, and that the number admitted to teacher training-schools be limited by a testing program. Numerous competitive state scholarships should be given to the various colleges and universities thus enabling the worthy but financially embarrassed youth to go on to school. An adult education program utilizing the equipment, facilities and personnel of the educational plant was urged.

If the state of New York, which spends more money per capita than any other state in the Union, has found its schools ineffective and unsatisfactory, then it is high time some of the rest of us were checking our programs.

I have on my desk a statistical circular issued by the Oklahoma State Board of Education, October 10, 1941. It gives the proportion of first-year pupils who enter each succeeding year of school and the percentage who finish high school and college. In many ways the figures are encouraging, but there is much yet to be done.

In the class of 1920, from every 1000 who entered the first grade, 215 graduated from the eighth grade, 113 graduated from high school, 61 entered college and 21 graduated. In the class of 1925—those who finished college last year—from every 1.000 who entered the first grade, 276 graduated from the eighth grade, 156 graduated from high school, 72 entered college, and 35 graduated. In the class of 1933, from every 1000 who enrolled in the first grade 355 were promoted in 1940 to high school.

It is highly encouraging to look down the rows of figures and note the increasing percentage of our youth who are completing additional steps in their academic training. Each year we can see that more students complete the eighth grade and a larger number finish high school and college. It is also interesting to note that a larger percentage of those who enter high school and college graduate. This may indicate a lowering of academic standards as well as an increased persistency on the part of the pupils. Who knows?

However, encouraging as these figures may be, our educational system is still failing to perform its proper function when only one-third of those who enter our elementary schools finish and only one-half of those who enter high school and college graduate.

In conclusion, what is the lesson which we as Academy members may draw from these studies and surveys? Should it not be possible to apply our research facilities to the testing of our academic product just as we do our scientific? Should we not be able to measure as accurately the results of our educational system, as we do the biological effects of vitamins, hormones, and immunizing agents? Is it not high time that we were applying to our educational programs some of the same research methods that we have been applying to our commercial and scientific endeavors. What, how, when, and where should we teach this information, or should we? What function does General Zoology serve in an educational program for the majority of college freshmen? Can we not answer these questions?

Oklahoma has recently established a coordinating body designated as the Board of Regents for Higher Education. It is to be hoped that this group of men will sponsor and undertake a program of study which will

go a long way toward providing a solution for some of the problems presented here this afternoon.

Dr. Bradford Knapp in an address before the Academy of Science in 1926 made these statements:

> "Knowledge advances under the influence of inquiry. Education that is contented with the mere routine of passing on that which has been known for years past to the on-coming generation, has no advancing program and therefore must fail of its purpose." . . . "Research is the widening of the scope of what we know and understand . . . "Research, as well as education, must be the foundation of intelligent democracy. . . "Except for its effect upon himself (the researcher), research is of little value until it is popularized, disseminated and assimilated by the people."

The Oklahoma Academy of Science furnishes a common meeting ground and opportunity for an open forum of discussion of all those lines of science which relate to the lives of the people of this state. The activities of the society stimulate its members and keep them posted in other fields as well as their own. The statement of purpose, as given in the Constitution, establishes the Academy as one of the basic educational organizations of our state. May we ever hold true to our goal and continue to provide the State of Oklahoma with valuable information and inspiration which can be used in the education of our people.

I thank you.