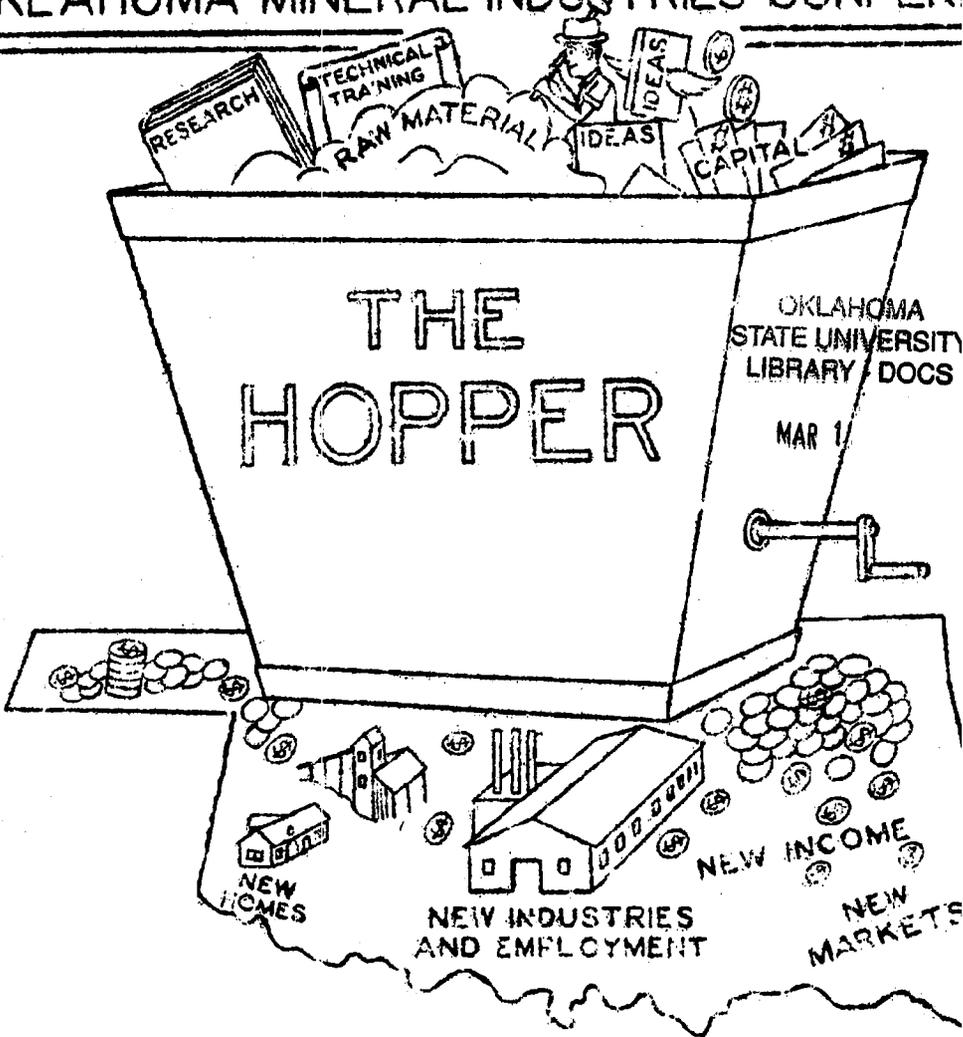


OKLAHOMA MINERAL INDUSTRIES CONFERENCE



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HOPPERATOR'S PAGE

INDUSTRIAL AND MINERAL INDUSTRIES CONFERENCE
OKLAHOMA CITY, OKLAHOMA

R E S O L U T I O N

October 13, 1948

WHEREAS, the University of Oklahoma, through Dr. George L. Cross, President, invites this group to hold its 1949 meeting on the campus of the University at Norman, and,

WHEREAS, it has been some years since this group has met at the University, during which time the facilities of the school, the Oklahoma Geological Survey, and of the Research Institute have been greatly expanded to better serve Oklahoma industry,

THEREFORE, BE IT RESOLVED, that the conference accepts the invitation to meet in Norman and names the following Program Committee to be in charge of all arrangements, including the 1949 reunion of the members of the Oklahoma Industrial Tour:

Robert H. Dott, Chairman
Clarence Burch, Vice-Chairman
Thurmon White, Secretary
Oscar Monrad, Member
William Michaels, Member
Dr. George L. Cross, Ex-Officio

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Other resolutions will appear in future issues
of THE HOPPER.

SCIENCE AND YOU

by

H. E. Fritz, Vice-President
B. F. Goodrich Company
Akron, Ohio

I am convinced that my company chose wisely and well in locating one of our largest manufacturing plants within the borders of this state, a part of America's newest industrial empire and destined, in my opinion, to be one of its greatest.

I should like to say a few words about two of your most illustrious citizens, Governor Roy Turner whose invitation I accepted to appear here, and Major General F. E. "Fritz" Borum.

The great Southwest is now the nation's most rapidly expanding market. The development of new products and new processes have laid the foundation for a rapid march toward new horizons of opportunity and solid progress. Your administrators, business men, and scientists have played a dominant role in that transition.

Governor Turner, you and your people have done a great job in the Great Southwest.

It has been my privilege to have worked with General Borum for many years on problems and projects of importance to the Army Air Forces; and I wonder if you knew that some of the vital contributions to our Air Army, which proved its tremendous capacities and striking force during World War II, stemmed from work that was started and continued under "Fritz" Borum's direction.

To most of us science infers intelligence of some kind or other, that is, we assume that after all the years of study and observation we know

something in general. But now you have asked a researcher to leave his ivory tower and come before you, and if we talk about research or scientific research, then we at once must make admission of ignorance. Otherwise, why would we be searching for something we don't know anything about? Research is just another way of saying, "We don't know yet."

But intelligence of the ignorant kind plays an important part in scientific research. You must be ignorant or dumb enough to try in spite of the fact that it is obviously impossible, and intelligent enough to sell the idea to wise and shrewd people - the bankers, doctors, lawyers, accountants, and engineers - after you have once proven to yourself that the process works.

I am sure you all know that this country has taken the world's supply of fundamental scientific knowledge and gone further with it than any other nation in the world, but the important thing which is not well known and should be emphasized over and over again is the fact that we Americans contributed very little to that stockpile of basic and fundamental information.

The amount of effort devoted to first-class fundamental scientific research - the kind that really hits the jackpot - has been infinitesimally small as compared to the effort on applied research.

In the past we have simply accepted that fundamental information as a gift or heritage left to us by scientists who have always exchanged views internationally, solicited criticism on a world-wide basis, and published their results around the globe. But the iron curtains are beginning to fall; satellite nations are in evidence; free exchange is being suppressed - the next world-shattering discovery may be withheld from us. This is a

blunt warning that we must step up the quality and quantity of our fundamental research. We must have our own knowledge stock-pile of sciences, and it must be second to none in the world. Now, only the scientist can and will contribute to that stock-pile.

A study of the history of mankind reveals that innovation is the chief source of security. This is best exemplified by the record of our own United States of America. The unprecedented growth of American industry has been due, in large measure, to American inventive genius and willingness to take risks.

Let me give you an example of the progress made in B. F. Goodrich and the rubber industry, because we have the liberty to take risks. During the last 25 years, American tire costs per 1000 miles have been reduced from \$2.35 to 65 cents and the key factor in this lowering of consumer cost has been the progress made in research and development through the application of this fundamental information. The future will afford an even greater scope of opportunity to research and technical men of that and all industry.

Let us remember that none of these fabulous gifts which we possess was created by man. A Great Divine Power created them and secluded them in such a way as to tempt or lure man to wrest them from nature. All man does is to discover these things which are natural laws. There is no way of obeying or disobeying these laws and since disobedience is impossible, there is no penalty. The penalty is for ignoring or defying the laws. The only thing the scientist does is to find out what the law is or determine the true facts, and since physical sciences deal only with the natural laws, the physical scientist should in no way be held responsible for the evil uses made of his findings, because in the past he has had no voice

in formulating final use to be made of these findings — whether this be right or wrong, it is the way. The decision has been made by the people who use them.

Take, for example, the art of television which has been developed technically for so long and which, as yet, has meant so little to us. It is a sad commentary — not on technology, but on us — that the best market for television sets is currently tap rooms and loafing places. Here a baseball fan can now while away a whole afternoon watching his favorite ball team play. The by-product of the marvelous invention of television is thus, in this case, more booze and less fresh air while watching the same old ball game. The slowness of mass humanity really to improve its lot or change its life as the result of technical progress is apparent everywhere.

During all the existence of man, three great and momentous scientific discoveries have been made, as follows: (1) fire; (2) the wheel; (3) atomic energy. With each of these fabulous discoveries came many evils which were of man's making and were a challenge to him. Somehow he has muddled through, and any new discovery of the future will be accompanied by similar evils. The great problem for mankind always will be to suppress the evils and to capitalize on the inherent values.

Fire was the earlier of these discoveries, a great dynamic power making possible the abandonment of caves and caverns. Picture the dawnman squatting on his haunches before a blaze he had started, dimly conceiving that here in his hands lay a tremendous new power, a new force — Fire.

Fire literally lifted our ancestors and predecessors out of slavery, suffering, and desolation. Let us be eternally vigilant to keep the fires of wisdom burning in our time.

The wheel ushered in the machine age. Shortly man could produce more food than he could consume. Sunup to sundown toil for mere existence vanished. There was time to think. The reaper, the mower, the Bessemer process, the airplane, the cotton gin, the railroad - all came in a rapid array of fundamental thinking. Freedom was rampant and within a few centuries the free mind really went places with this tool. The wheel of prosperity and plenty - a heritage for which we must be truly grateful.

Then, lastly, atomic energy. This could be the most fabulous of the three. We are not sure because we are the dawn people of the Atomic Age. For the first time since creation we hold the power to shape our own destiny. Atomic energy to us has some of the qualities and attributes that fire had to the dawn man. We are truly God's preferred children to be given the privilege of living in perhaps the most fabulous era in the history of the world - The Atomic Era.

The astounding difference between atomic energy and the energy (heat or fire) with which we are familiar lies in amounts required. Statistics show that less than 15 pounds of atomic fuel will produce enough electrical energy to meet all demands of the United States for one year.

One box-car of atomic fuel will produce enough energy to heat every building, illuminate every electric light bulb and operate every machine in the world for 1000 years.

At a recent meeting one of the students put the question as to how it would be possible to ship a box-car of atomic fuel, considering all the hazards involved.

Would there ever be any reason, excuse, or cause for shipping to one spot enough potential energy to supply the world for 1000 years?

Any realistic appraisal of the status of atomic energy today must be predicated on the principle that it is not an American secret. To understand why it is not a secret at all, let's go back 400 years before Christ. An atomic theory was propounded in that remote time by Democritus, a Greek philosopher. A Roman, Lucretius, wrote a classic poem about atoms before Jesus was born. The theory that all chemical elements are composed of atoms was corroborated 145 years ago. The structure of the atom was determined, and its energy known before World War I.

The fact that atoms of certain substances, specifically uranium, a metal, could be split, and that this splitting, or fission, was accompanied by the release of enormous quantities of energy was demonstrated before World War II. Let me repeat, this was not an American secret; it was known by scientists in many countries. The only problem since that time has been to capture and control the atomic energy thus released, and discovery of methods has been strictly a question of time.

Therefore, 145,000 scientists spent 2 billion dollars in this country applying those basic principles to the manufacture of an instrument of war, the bomb. It is, therefore, extremely unlikely that a disease such as cancer or any other serious malady can be mastered by such planned mass action and spending. What cancer is, its underlying causes, its by-products and consequences, must wait for basic information which may not be forthcoming for many years. If and when that basic information arrives, then and only then can masses of money and men be thrown to advantage into such a project.

The same was true of Pasteur's microbes, of Faraday's electromagnetism, Lavoisier's theory of combustion, penicillin, the sulfa drugs, etc. We can do little or nothing until we force nature to yield her secrets to us.

For these and other reasons, let us do everything in our power to promote the dissemination of information representing the true technological facts only, thus promoting a better understanding of the role and the place of science in our national life. It could be that some of us will live to see the day when a nation's true wealth will be measured in terms of the quality of its men and women of science, rather than in terms of its natural resources.

The frontiersmen who settled this, your country, risked their lives in the winning of it from the untamed forces of the wilderness. You and I are the frontier people of today and the frontier of today is just as ruthless, but different in that the big advances are made and big dividends paid through the frontiers of thinking.

To be sure we will not find greater wealth and prosperity running about loose to be hunted like buffalo, but the trained scouts of today, the scientific researchers, will find new ideas and meet with men looking for a chance to tackle new lines, help other men get new jobs, and find customers to buy new products. New pursuits always involve new risks. New ventures are full of uncertainty, but the American process has always been to face boldly the risk and uncertainty and to direct a course through freedom to prosperity. Free men, given opportunity, make their own security, for as long as they are free the game is worth the candle and they can afford to try and try again until they succeed.

Here then in science and research is insurance for all of us, insurance not only good for now - it is good for all time, because the free and fertile mind, through research, creates more employment, more security, and higher standards than any other known process.

This is the only kind of insurance that will sustain us as free people and perpetuate the process of liberty.

In all the years of recorded history there have been only 300 years in which man has been free of war, and wars are never won. We in America say we have never lost a war, but each war, more horrible than the previous one, devastates our resources, destroys our relationship with other human beings, and strips us of culture and education. Now man stands at the brink of atomic power - trembling and uncertain - trembling because of the implications of the atomic bomb. The atomic bomb is a fearful weapon and fully justifies our concern about it, but when one realizes that the death-dealing power of all the wars combined throughout history is insignificant as compared to Nature's death-dealing instruments, such as the black and bubonic plagues, influenza, polio, etc., there is reason to assume that our greatest wars may not be with the human beings, but against starvation and the hordes of insects, viruses and microbes that prey upon us.

It is a well-known fact that pestilence, plague and famine, in some form or other, have decided more campaigns than bullets.

Even the meager information available on biological warfare is as good a reason as the atom bomb for permanent postponement of World War III, and biological warfare, based on total killing cost per capita, is far more economical and hence easier to practice by the less wealthy nations, so the overall implications for the next war are staggering. We better not have one, but if it must and does come, then the next one after that will be fought with darts, blow-guns, sticks, and stones.

In my opinion, man is not simple enough nor potent enough to destroy himself. The obvious

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truth about the atom bomb is that all the nations combined, waging all-out war with atomic artillery would not penetrate the remote and non-strategic spots on this earth which man frequents. Therefore, our civilization may be destroyed, but total extermination of man is extremely unlikely during any atomic war. But if you do not concur with this belief and if you really desire a pessimistic outlook, then I can say with absolute certainty that some time in the not-too-distant future "We will have peace either with or without people."

But the potential of controlled atomic energy is even more staggering. Here is something which has a bearing on and a relation to those things which we at one time thought were divine powers. The atomic explosive is impressive, but let our concern be with controlled atomic energy, for if atomic power gives us still more luxuries, comforts and higher standards, then our greatest fear should be from the decay and degeneration. History says that many nations have tumbled and declined this way. Our major problem will be to absorb and utilize these greater comforts and leisure without succumbing to the accompanying tendencies to "Dry Rot". In any event, we could decay out, or pass out violently as a result of an enemy's atomic explosive; of the two the former is most likely.

How shall we meet this challenge? Our civilization faces the promises and problems of the future. Society has a chance which it must take, man must answer these searching questions:

- (1) He can bounce radio waves back from the moon; he can weigh and measure the most remote planet; but can he ever organize the planet on which he lives?
- (2) Is there any reason why we cannot be intelligent and unselfish at the same time? That we cannot be strong but not for the purpose

of forcing the other fellow to be good? If we could, it would mean the difference between fear, suspicion, scarcity, and wars on the one hand, and confidence, abundance and peace on the other.

Will modern man have the courage and fortitude to make these gifts of science his servant, or will they be his master? The burden of morality rests with you, the men and women who will determine the uses to which they will finally be adapted. We could be at the threshold of the truly golden era of manhood.

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RESOLUTIONS

At the business meeting of the Oklahoma Industrial and Mineral Industries Conference October 13, five resolutions were passed: (1) Accepting the invitation of the University of Oklahoma to hold the 1949 meeting on the campus in Norman, and appointing a program committee; (2) appointing a committee to consider forming a permanent organization, to carry a new and shorter name; (3) expressing appreciation to speakers at the Conference, and exhibitors at the Exposition for their efforts for the advancement of Oklahoma; (4) expressing appreciation to the Oklahoma Planning and Resources Board and Oklahoma City Chamber of Commerce, for scheduling the Made-in-Oklahoma Manufacturers' exposition in conjunction with the Conference, and commendation for the fine job; (5) commenting on the part played by the programs of the Oklahoma Geological Survey and Oklahoma Planning and Resources Board in industrial development during the past two or three years; thanking the Oklahoma Legislature and State Regents for Higher Education for support of these agencies; and expressing the hope for their constructive interest in these agencies in the vital years to come.