

Industrial and Educational Cooperation

Address before Twentieth Annual Convention of The American Oil Chemists' Society

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IT gives me pleasure to say a few words to this society in regard to the field of chemistry and its relation to the progress of different industries. Chemistry, as you know, may be considered one of the exact and most fundamental sciences and its province, in the classical definition of Ostwald, is "The Study of the Different Forms of Matter, Their Properties and the Changes Which They Undergo." The industrial chemist asks no better definition of science than that it is organized common sense and that men of science are men trained in common sense.

The study of chemistry embraces the entire material universe, our solar system, the distant stars and the small particles that float through space, known as dust. There is not a thing in the world, living or inanimate, that the knowledge of chemistry does not help you to understand and appreciate to the best advantage. It is directly concerned with the physical basis of our bodies, with the food we eat, with the water we drink, the air we breathe, the materials upon which we work in our daily labor, and the things we buy and sell in our daily life. We live surrounded by an ocean of air and we draw some of this air into our lungs about eighteen times a minute. It has a certain approximate chemical composition which influences our daily life by the oxidation or consumption of the food we consume within our bodies producing energy and heat and building up broken down tissues. Our body is nothing more than a human furnace which consumes fuel as food, and produces both mental and physical power by the use of the oxygen of the air to support the combustion of that food. You know it is a fact that you have to furnish a certain limited amount of air to a furnace, or you will not get maximum efficiency; so it is that the human body has to breathe plenty of pure air. There is not a thing you handle every day that does not have a chemical composition, and I would like to see the inquisitive side of all natures so developed that they could not come in contact with any material thing unless they asked the questions: What

is its composition? What can be produced from it? The world, as viewed by different individuals, generations, and races of men, provides different realizations of the beauty of nature and dreams of unknown possibilities. To the chemist it is a field of opportunity for the onward progress of science and industries.

This is a chemical age, and we live, move and have our physical being as a result of chemical processes, and whether we travel on foot in chrome-tanned shoes and rayon stockings or go to work on rubber wheels and concrete roads, we travel in comfort by "the grace and good-will" of science. Tons of sulphuric acid and arsenic used to be blown from the tops of smokestacks of copper smelters, killing animals and plants on neighboring farms, but today these poisons have been harnessed by science; the arsenic put to work for agriculture in killing the boll-weevil and the sulphuric acid used to make phosphate rock available to feed the hungry plants as fertilizer. By suspending a few crystals of copper sulphate in water the growth of plants known as algae can be controlled in our water supplies and the irrigation ditches freed of this nuisance thereby increasing the wealth of the irrigation regions. A scientist is your defense against laws more dangerous to break than any others—the laws of nature. If business breaks these laws, the penalty is usually death. The industry cries out too often that they have millions for defense but not one cent for keeping out of trouble before it happens. Chemical science is the dominating factor in the field of human welfare.

Efficiency before Productivity

THIS should not necessarily be a day of increased productivity but it should be a day of increased efficiency in production, and every industry of recent development recognizes this fact. The field of an industrial chemist is broad and the harvest in all industries is ready. This is true in all the large industries where they need men trained in chemical knowledge for the control of their processes. They are crying out every day for young men who know something definite and can put it to practical use. As you know,

knowledge is power, but if you cannot put this knowledge to some practical use it is worthless. It is the application of the theories you have learned that makes you of value to yourself and your fellow-men. Otherwise you are nothing more than a cog in the wheel of the advancing industries. This is a day of conservation and you hear a great deal in regard to the conservation of our natural resources. We should not only conserve our natural resources but we should practice the conservation or use of our waste materials from the different industries. At one time the potash salts that exist in the Stasfurt Mines were considered an impurity as they were working the mines for common salt and they were abandoned for that purpose because of these impurities. But today these mines are worked for the potash salts they contain and this has grown to be one of the large industries in the world. As you know, milk is composed of the following constituents: fat, casein, albumin, ash and milk sugar. They use the fat to make butter; the casein in the making of cheese, artificial ivory, combs, billiard balls, cold water paints; and milk sugar in medicinal preparations and for the sugar coating of pills. It was believed at first that the albumin was an undesirable nitrogenous waste material, hard to get rid of, as it was easily decomposed and they paid farmers to haul it away. It was first used as a fertilizer, then as a chicken feed and today it is regarded as one of the important constituents of baby foods. The by-products of the packing and soap industries were at first regarded undesirable but today they are very important and profitable products. Our duty therefore is to persuade these chemical facts to work for industry.

If the South is to become one of the leading manufacturing sections of the Union it will be necessary for the industries to look to the engineering colleges for men to direct these enterprises with efficiency and skill. In the past when competition was not so strong it was possible to make rapid strides under less efficient leadership but today, and more so, tomorrow, the success of any industry will be measured by the efficiency of its management and research. Those of you who have done the pioneer work in building the great cotton seed oil interests of this section have shown your skill and your ability, but you well know that you must have trained assistants if your businesses are to become larger and more successful. The management must be in the hands of men trained for the purpose either in college or in the "school of hard knocks." Industries must not only recognize executive

ability but the value of research if they expect to meet competition and this condition will be more and more marked as the industries of the state develop. Eternal research is the price of survival in modern industry. Science is advancing so rapidly and with results of such far reaching influence that no industry can hope to ignore research and live. Industries must understand that we are in the midst of an industrial revolution, in the course of which many established businesses will find their balance sheets deeply colored with red unless those in executive control can read the handwriting on the wall and direct their course in the flood of new knowledge coming from the research laboratories.

Industrial developments along new lines are everywhere in progress. They call upon the chemical engineer for new equipment and new methods of production and control. Do you think that the progressive men connected with one of the oldest and largest industries are going to be content to sit idly by the tide of progress? Will they be satisfied to use old methods based on "rule of thumb" and not let scientific methods show them the way to new industrial efficiency in milling and refining? Will they not be progressive enough to say "what is good enough for father is not good enough for me" and make the cotton seed oil industry one of the most advanced of all? I would not for a moment have you infer that I think a college course can give a man anything which it is not possible for him to get himself outside of college, but I do believe that it is only the exceptional man who will get it outside. The college course merely provides a more orderly procedure in the mental training, and a more logical sequence in the development of the students' "thinking powers." The South from an industrial standpoint is one of the wealthiest sections in the Union but she needs trained men to develop and control her industries. The State of Texas raises one-fourth the cotton to clothe the world, yet she imports practically all of her wearing material. She produces large quantities of cotton seed oil but imports soap, produces hides to shoe the nation but imports all her shoes. The work of the engineer is the changing of the raw material into the finished product with the greatest efficiency and with the least possible cost of production. He substitutes a rigid control of processes for guess work and uncertainty and increases the productivity of labor by supplying more efficient processes, where the standard and quality of the finished products are revised, and the amount of seconds and rejections are reduced. This should not only

be a day of increased productivity but it should be a day of increased efficiency in production, and every industry of recent development recognizes this fact. How many business men can tell the quality of the gas, coal, or lignite they are burning, or the amount of slate or other impurities they are purchasing for fuel? How many pay two prices for their lubricating oil while with a little control work and expense they could materially increase their profits? Do you call this industrial efficiency? This is not efficiency, but wastefulness and the time is coming when all material will be bought and sold under specification, defining the quality desired and making rigid tests to make sure quality is received. This would be more satisfactory to the producer and the consumer.

Engineering Education

CCOURSES in engineering in the colleges are occupying a position of constantly increasing importance. The development may be said to be due not only to the recognition of the importance of engineering in the training of every liberally educated person but to the fact that the development of the industries are dependent upon a thorough knowledge of engineering. The engineering courses at the Agricultural and Mechanical College of Texas are designed to prepare men for industrial leadership. Every industry should be under the control of a man trained for that purpose. He who builds the factories and directs the processes of manufacture is an engineer. Texas has educated few men along this line and the demand of industries for engineers is increasing more rapidly than men with engineering training can be supplied. The industries are constantly crying out for men who know what they want and want what they know. The A. & M. College of Texas asks only the opportunity to help the industries in selecting men for their organizations by recommending to them men who have stood the test by sticking to a four year course in college through many difficulties and by living in dormitories where they have to learn to live in harmony with their associates. We do not expect to prepare young men ready to step immediately into positions where they must assume great responsibility and display mature judgment. We try to impress on the boys the idea that their education is merely a foundation on which they must build and I believe you will find that what the young men ask is merely a chance to begin at the bottom and find their own level. They seek the opportunity to learn your business with a living wage comparable to their training. They do not ask favors on the strength of their diplomas,

but merely the opportunity of showing what they can do with the training they have received. Hard work is not a new experience to most of these boys for a very large number of them have earned a considerable part of their college expenses. My purpose here is not to ask you to assist in giving employment to our graduates for, as a matter of fact, the demand far exceeds the supply, and practically every young man who is graduating this year from our engineering classes has already definitely accepted employment, and we could have placed three times as many.

Competition in industry is so strong that we can no longer ignore the possibility of increasing profits by a larger and more efficient production. This is a day of centralization of wealth, of power, of commerce, or marketing, of farming and of industry where the brain of one master mind controls the policies of large production and distribution. The methods of today are no longer the methods of yesterday. What was good enough for father in business is no longer good enough for us. Today is not today but more like tomorrow for we keep step with the revolving world so closely that the twilight of today becomes the dawning of tomorrow. Sunset and sunrise are as one. The advancement of science in the cotton seed oil business has only begun. The surface of efficiency has only been scratched, and in the next ten years the industry will be completely changed so that its processes will be placed upon a more scientific basis and the mills will be controlled and supervised from the laboratory. Guess work will be superseded by exact knowledge obtained through research. Through the application of chemistry and engineering these possibilities will be realized.

So looking forward to the possibilities of advancement of science in the great cotton seed oil industry, the Agricultural and Mechanical College of Texas through its Department of Chemistry and Chemical Engineering has put forward every effort to develop industrial cooperation with the educational institutions. This contact was at first attempted by the establishment of a lectureship whereby the Texas Cotton Seed Crushers' Association sent to the College representatives from the industry to speak to our students of the commercial processes and outline to them the opportunity for scientific control and advancement. This opened the way for a closer contact as the officials of the association became more interested in our college work and recognized the fact that we were training Chemical Engineers for the industries of Texas and the South. Today

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every member of the Texas Cotton Seed Crushers' Association is heartily and enthusiastically behind the program at the college exemplified by the association placing at the disposal of the college a complete cotton seed oil mill where we take the seed from its crude form to the finished products lint, hulls, hydrogenated oil and soap. This is the only mill operated by an educational institution for the training of college graduates in Chemical Engineering. Next year we have available six graduate fellowships of \$600.00 each to assist students to pursue graduate work in the field of cotton seed oil mill operations by which we expect to demonstrate to the cotton seed oil interests that the basis of industrial progress is research.

The College also conducts a ten day summer short course for cotton seed oil mill operators which has met with an enthusiastic reception shown by the large attendance at the first meeting last year. It has been impossible for the department to meet the demand for our graduates in Chemical Engineering although we have a registration of two hundred and eighty one in the four year course. We also place a large number of our undergraduate students in the industries during the summer vacation months in order to assist them to meet expenses the following year and obtain a broader view of the industrial possibilities.

I want our students to get a place in the mills or in the refineries so they come in practical touch with operation of a cotton seed crusher or with the refining side of the cotton seed oil business. These men do not ask favors of anybody. They do not wish white collar jobs; they do not want any one to say they are college men; but they are just the ordinary man on the job. You know, sometimes we look at a college man as a man who is stuck up and will not do labor, but I want to tell you that the A. & M. College graduate is not the man that is afraid to wear the overalls, as long as there is an opportunity to learn and a possibility of advancement. I hope you will realize that the A. & M. College of Texas is trying to function as a part of industry and not apart from industry. We are always open to suggestions and we want your advice. We do not think our work is perfect. We see defects which we hope to correct in time, and we shall all work together on the firing line to attack and solve the many problems on the rocky road from the laboratory to the plant.

Foreign Trade Opportunities

The Bureau of Foreign and Domestic Commerce of the Department of Commerce announces that its representatives in all parts of the world have forwarded the following trade inquiries of interest to our readers. In writing the Bureau in reference to any of these inquiries please mention that you saw it in *Oil & Fat Industries*.

No.	Location	Material	Purchase or Agency
38858	Oslo, Norway	Cottonseed Meal	Agency
38848	Dusseldorf, Germany	Lard	Agency
38849	Montevideo, Uruguay	Soybean Oil	Agency
38553	Montreal, Canada	Coconut Oil	Both
38677	Melilla, Morocco	Lard	Agency
38611	Bolzano, Italy	Lard	Purchase
39068	Bombay, India	Tallow, Mutton	Both
38973	Strasbourg, France	Lard and Industrial Oils	Both

Frank Honicker, Executive Secretary of the Mayonnaise Products Manufacturers Association of America, urges all members to bear in mind the Fourth Annual Convention of the Association, to be held at the Traymore Hotel, in Atlantic City, October 28 to 30, 1929. President C. P. McCormick promises a lively program which will be of interest to every member.

Margarin production in April, 1929, shows a substantial increase over the 1928 total for the same month, according to figures released recently by United States Bureau of Internal Revenue:

	Pounds	
	April, 1929	April, 1928
Uncolored margarin	27,237,173	22,989,710
Colored margarin	1,466,441	1,300,807
Totals	28,703,614	24,290,517

Attempts of a group of manufacturers of colored cooking compounds to enjoin the Bureau of Internal Revenue from collecting a tax of 10 cents per pound on their products under the oleomargarin law have met with failure in the Supreme Court of the District of Columbia. The court granted three temporary restraining orders against the bureau, but dismissed them on argument and refused to grant injunctions pendente lite.

The controlling interest in Food Products, Inc., has been reported purchased by Gelfand Manufacturing Co.