THE PREPARATION OF CHEMISTS FOR INDUSTRY

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NOTE: As it was advisable for Professor Norris to change the subject of his address at the last moment, it is possible to give only a brief outline of the points made and the questions raised. The address was not written.

It seemed an appropriate time to raise two questions to which the speaker had given much thought. Are the universities of the country preparing their students in the best way to be successful in the chemical industries? Is there some way for the professor to gain more definite knowledge in regard to the success or failure of his students? In business, a manufacturer takes special pains to find out whether his product is satisfactory to the customer. The men who are training chemists do not have a method to test their product. The audience consisted largely of teachers who are training chemists, industrial chemists and those who employ chemists. For this reason it seemed that the occasion might be taken to consider the two questions already stated.

The teacher wants to prepare the best product. Is he on the right track? The employer sees faults in the product. How can these be corrected? It is probable that the teacher and the employer need education. The teacher needs to know more of the requirements; the employer needs to know more in regard to what is possible in collegiate education. The first thing to be done is for the teacher to study himself and his methods. In his estimate of men, is he relying too much on scholastic grades? Does he know the requirements for successful work in industry or is he ignorant of these through lack of contact with industry? Is he emphasizing the right things in his courses? He strives to impart the new knowledge to his students. Is he right when he expects Freshmen to have a detailed knowledge of the structure of atoms, dipole moments, the composition of vitamins,
the theory of Debye and Hückel, and many other such topics? Would it be better for him to concentrate the attention of the beginner on simpler things and reserve for later courses the more abstruse side of the science? Is he intolerant of criticism given by men in industry? Is the teacher aware of the technical advances? A professor was asked if he illustrated his principles by examples drawn from recent new processes and patents. He replied that he had so many principles to teach, that he did not have time for the consideration of these applications. He later admitted that he did not know them and fell back upon the usual statement, that his course was designed to give mental training.

What does industry want in its new men? One large organization has come to the conclusion that graduates in chemistry, when they enter upon their work, are densely ignorant of chemistry. Examinations are given to applicants. It would be a great thing for the teacher if he could see these examinations and find out what this industry thinks is so important that the student should remember the facts involved. Another industry is keeping a personal record of new employees. It would be a great help if these records were submitted to the teacher who trained the men. An examination of the records would bring out more clearly whether the opinion of the professors and their recommendations were in accord with the later accomplishments of the students. At times men are dismissed. It would be a help if the teachers of these men had called to their attention the faults of the men dismissed. An employer of a large number of chemists said that the recent graduate lacks an economic point of view in regard to the problems presented to him for solution. Another employer criticized the lack of mature judgment. Such criticisms as these, while extreme, could be, in part, met by a thoughtful teacher. It is impossible to give a student in a university a detailed economic point of view, but certain aspects of the subject could be stressed and the student introduced to that mode of thought. Another high executive in a corporation was
asked to criticize the syllabus of a Freshman course in chemistry. While the criticism was very extravagant, there was a certain amount of justice in a part of it. In another case, the head of the chemical engineering department wrote to the employers of a number of students and asked for a statement of any lack of knowledge of the students. The reply came in repeatedly, that the students did not know enough organic chemistry. The result was, that more organic chemistry was introduced in the course for the engineers. Facts, such as these, were mentioned to show that if there could be brought about a cooperation between the trainer and the user of chemists much good would result. When the employer notes that the students are deficient in report writing and clearness in expressing results, such deficiencies can be largely obviated.

Next to helping in the preparation of a student is the recommendation given by the teacher when the student is considered for a position. Such recommendations can be written intelligently only when the professor appreciates what kind of intellectual ability and qualifications are necessary for success. The point of view of the employer must be kept in mind. In making recommendations, certain problems arise which are difficult to solve. For example, an employer requests a professor to recommend some first-class men who are employed and have worked, say for two or three years. Is it ethical for the professor to comply with this request? Does he not have a responsibility to the present employers of the men who have trained them since their graduation?

It seemed important for the professor and the employer to get together and talk over the question raised, and many others of the same kind. It is a question of the salesman and the customer, but it is to be remembered that the slogan used in business—"The customer is always right"—will not hold in such a conference. Industry should tell us what they want and we should ask—"Is it reasonable"? One knows there are certain qualities desired for success which do not involve chemistry.
Initiative and personality are two of the most important. These should be kept in mind because both can be developed during the time the student spends in college. It is important that the employer should be willing to state freely to the teacher the causes of success or failure of the student. Can some way be brought about which would induce the employer to give such information to the teacher so that he can improve his product and arrive at a more definite estimate of the student to be used in recommending him to an employer?