

1903

American and German Universities

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Recommended Citation

Richards, Joseph William, "American and German Universities" (1903). *Early Publications of the Lehigh Faculty*. Paper 147.
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CRITICAL NOTES ON DR. F. HABER'S REPORT ON ELECTROCHEMISTRY IN THE UNITED STATES.

CHEMICAL EDUCATION IN THE UNITED STATES AND GERMANY.

BY THEODORE WILLIAM RICHARDS.

Dr. Haber's report was highly interesting to me, and I am glad to say a word about his discussion of chemical education. On the whole, I agree with Dr. Haber's criticism, both favorable and unfavorable. That much time is lost in our college preparatory schools, and that this loss is due partly to the restless spirit of our nation, I cannot doubt. It must be granted, also, as Dr. Haber asserts, that too much of our teaching deals with knowledge as if it were complete, instead of in the process of growth. I quite agree with his praise of our methods of teaching elementary chemistry in the laboratory. I do not think that he makes it quite clear that the courses in chemistry which he quotes lead only to the degree of bachelor of science, and that the doctor's degree in America usually requires three years more of original work. Much of the work which forms a part of these scientific school undergraduate courses is counted toward the doctor's degree in Germany. The confusion caused by this difference in classification makes it a difficult problem to compare the value of the degrees in the two countries.

With Dr. Haber's unqualified opinion concerning the practical importance of physical chemistry I emphatically agree. Whether the present theories advanced by this branch of the science are transitory or permanent, it seems to me that knowledge both of its subject-matter and of its method is essential as well to the manufacturer as to the investigator in any branch of chemistry.

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AMERICAN AND GERMAN UNIVERSITIES.

BY JOS. W. RICHARDS.

In the technical part of Dr. Haber's paper I have noticed extraordinary assiduity in collecting facts, and clearness in stating them, so that the report forms, in this respect, one of the best general reports on the condition of the electrochemical industry in America which has ever been written. I note some places, however, where he has practised "the scientific use of the imagination," to fill up gaps in his information, and sometimes with results far from the truth.

In the discussion of our university and technical school instruction, Dr. Haber is usually correct in his statements, but his information is more fragmentary than concerning our electrochemical industry. He studied the later pretty thoroughly;

the former, necessarily, only partially. His conclusions as to the low entrance requirements for our universities, and the low plane of undergraduate instruction given in them, may be true of those which he visited and describes, but is founded on too hasty and fragmentary a study of our universities and technical schools as a whole, to give much value to his generalizations, and really does grave injustice to some of our best institutions. I should say that it is impossible for even so keen an observer as Dr. Haber to give an entirely just opinion of our system of higher education as a whole, with less than six months' study of the subject here in America. Some of Dr. Haber's criticisms are true, some are only partially so; that is, they are true only of the institutions which he particularly chose for examination, and so do not apply unreservedly to all our universities.

After all, Dr. Haber would criticise us, as compared with Germany, for the relative absence of the deeper philosophical and theoretical studies and the preponderance of eminently practical subjects. On the other hand, we might reply by criticising the relative absence of the latter in the German universities. The golden, well-balanced mean between the two schools, between academic pedantry, on the one hand, and narrow commercialism, on the other, is the goal toward which our best institutions are tending, and toward which they are advancing more rapidly and more hopefully than the European universities.

LEHIGH UNIVERSITY.
