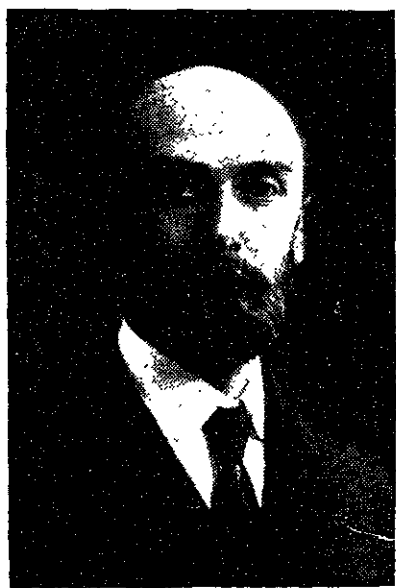


INORGANIC CHEMISTRY

By HENRY P. TALBOT.

The instructional problem presented by the subject and its position in the curriculum is not an easy one to solve. Provision must be made for students with a little knowledge of chemistry (often dangerous), others with no previous experience, and still others with considerable previous training in secondary schools. Moreover, provision must be made on the one hand for the chemist, and mining or chemical engineer to whom chemistry is a professional subject, and for the civil engineer and mechanical engineer to whom chemistry is not an unalloyed joy. And to all this is added perhaps the most important task of all, the induction of these students into proper scientific methods of observation and reasoning. A subdivision of the class based upon previous experience in chemistry (or its lack)



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in the first term, and in the second term upon prospective choice of chemical subjects in later years, has simplified the task somewhat and increased instructional efficiency.

The instruction comprises, first, lectures, in which are discussed the important principles and the salient facts chosen with reference to the application of these principles and to their practical importance; second, recitations which are regarded as the students' opportunity to clear up his uncertainties, and for this every encouragement is given; and third, the laboratory exercises, which are regarded as perhaps the most important phase of the course. Here the student is encouraged to try to reason from observations, necessarily under considerable guidance at first, and always under such direction as to try

to avoid groping and the drawing of wild conclusions. Greater stress is laid upon a relatively small amount of careful work than a wider range of experimentation of an essentially descriptive character, in order to attempt to lay a firmer foundation for later study whether in chemistry or along other lines. The careful and intelligent recording of observations, a matter which is always difficult of accomplishment at first, receives its due share of attention.

In the second half of the year the laboratory work takes the character of synthetic inorganic chemistry, to illustrate the chemistry of typical compounds, for those who will continue with chemical subjects, while the engineering students in non-chemical courses have laboratory practice in qualitative analysis, and some other laboratory work especially adapted to their needs.

The recitation and laboratory instruction is in charge of Professors T. E. Pope, F. L. Bardwell, A. A. Blanchard, Mr. J. W. Phelan, and Drs. E. B. Spear and S. Jordan. The lectures are given by Professor H. P. Talbot.

HISTORY OF COURSE

(Continued from page 41.)

a wide experience in Industrial Chemistry and Metallurgy, and was made Professor of these branches of instruction, holding that position until 1885. In 1870 we find Professor R. H. Richards temporarily serving as Assistant Professor of Analytical Chemistry and Professor William Ripley Nichols, to whom the Department owes so much for his successful labors in Sanitary Chemistry, as well as the gift of his library, entering the Faculty as Assistant Professor of General Chemistry. In 1871 Professor James M. Crafts took Professor Warren's place in Organic Chemistry coming fresh from the field of research, and gave an added impetus to the Department.

In 1873 the differentiation between the various professional courses began at the opening of the second year and the Course in Chemistry was somewhat remodeled, and more time was given to chemistry in the second year. In 1873 Professor Charles H. Wing became a member of the staff and did much to place analytical chemistry on a more refined basis. In 1878 the Women's Educational Association of Boston endowed the Women's Laboratory, which was then located in a one-story structure occupying the space now vacant between the Rogers and Walker Buildings. In this laboratory Mrs. Ellen H. Richards was instructor in chemistry and mineralogy and in association with Professors Ordway and Nichols carried on an immense amount of analytical and experimental work along lines of sanitary and industrial chemistry which later formed the foundation for the development of these branches in our Chemical Department. In the same year

three options, one in mathematics, one in natural sciences and one in industrial chemistry were offered within the chemical course.

The transfer of the Chemical Department to the Walker Building in 1883 placed it in temporarily commodious quarters and made possible a general development. Professor Lewis M. Norton then took charge of the Organic Chemistry and later of the Industrial Chemistry, and to him much credit is due for the development of these branches, and for inspiring teaching.

In 1885 Professor Thomas M. Drown became Professor of Analytical Chemistry and was soon placed in charge of the Department. He, in association with Mrs. Richards, developed the work in Sanitary Chemistry and during the next few years instituted and developed the elaborate system of examination of the water supplies of the State which was unique in its extent and thoroughness and has served as a model for all later work along these lines in this and other states. Over 20,000 samples of water were examined and reported upon in the Institute laboratory, making it the leader of its sort, and after the work was removed to the State House, Dr. Drown remained until his death consulting chemist to the State Board of Health. Dr. Drown was also instrumental in gradually introducing a greater variety of specialized and optional subjects into the Chemical Course.

In 1888, as a result of a demand for a course which should combine chemistry with engineering, and after conferences of Professors Norton and Drown and the members of the Department of Mechanical Engineering, a Course of Chemical Engineering was announced which was under the charge of Professor Norton. This course was mainly one of mechanical engineering with a limited amount of fundamental chemical instruction. On the death of Dr. Norton in 1893 the Course passed to the care of Dr. Drown and was united with the Department of Chemistry. For some time after the resignation of Dr. Drown to accept the presidency of Lehigh University, the Department remained without an officially appointed head. During that time the course in Chemical Engineering changed but little and the main change or note in the Chemical Course was the introduction in 1900 of five series of consistently arranged optional studies, of which three remain at present, one series involving mechanical engineering subjects having been abandoned when the Chemical Engineering Course was modified, and one in Metallurgy proving to be impracticable. In 1901 the Department was placed in charge of Professor H. P. Talbot.

After a careful consideration of the demands made upon the graduates entering the field of applied chemistry, as chemical engineers, it was determined in 1905 to remodel the Course in Chemical Engineering and to give it its present form, that of a course which is

mainly one of chemistry with as much fundamental engineering as the time permits, the proportion of time devoted to chemistry being almost twice that devoted to engineering. Since then the course has undergone only minor changes.

Meanwhile the work of the Department has grown rapidly. Its originally commodious quarters have been many times extended, with the result already stated. In 1903, through the generosity of Professor A. A. Noyes, the Research Laboratory of Physical Chemistry was established, which, though not a part of the Departmental organization, has afforded exceptional opportunities for the work of advanced students. Still more recently, 1908, the Research Laboratory of Applied Chemistry was organized as a branch of the Department under the Directorship of Professor W. H. Walker.

The staff of instruction comprises thirty-three members exclusive of the research workers and is providing instruction for nearly a thousand students yearly, and the business transactions of the Department, which are under the immediate charge of Professor A. H. Gill, amount to about \$15,000 annually.

With an unusually loyal and capable instructing staff, a large number of successful graduates, and a demand for others much in excess of the present supply, together with an increasing appreciation in the country at large of what the chemist and chemical engineer can accomplish, and an increasing interest on the part of our students in chemical engineering, the opportunities and outlook for the future of the Department seem unusually bright.

FIELD OF CHEMISTRY

(Continued from page 45.)

When I was a Freshman at Tech, I chose Chemistry as a profession because I liked it. I did not like the financial outlook, but I was incapable of judging it. I was fearful lest I should fail to make good. If I were suddenly to find myself again a freshman at Tech, I would again follow Chemistry. By my inability to do more than keep up with the requirements of the course, I should regret not being able to acquire simultaneously a broader knowledge, but that is all. I cannot recall any considerable part of my work in the chemical course which I should be willing to exchange for its time-equivalent in more general college studies. I am enjoying some of these general pleasures now, probably, more than I should, had I been forced to study them earlier. I should look forward more to acquiring proper habits of thinking and doing than to storing up the detailed knowledge set before me, however interesting it was to the teacher.

I should want to feel early that I was making the realm of Chemistry my personal property in which others could

(Continued on page 43.)

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