

THE COURSE IN SURVEYING

By PROF. G. L. HOSMER.

While the subject of Surveying does not occupy such an important place in the curriculum as it did formerly, on account of the introduction of a large number of engineering subjects, yet its actual importance is only increased by this development of Civil Engineering. It is true that there are few engineers who devote the whole of their time to surveying; it is also true that there are few engineers who do not at one time or another have occasion to make surveys in connection with their engineering practice.

The course given to the civil engineers at the Institute is devoted chiefly to general methods of surveying. Special lines of work such as Underground Surveying, the U. S. public land system, hydrographic surveying and others, are all of great practical importance and deserve a place in any extended course. But the time allowed for this work is so brief that any attempt



PROF. G. L. HOSMER.

to teach specialties would be unsatisfactory. The instruction is therefore limited to the general methods which necessarily apply to all classes of surveying.

One of the advantages offered by a course in surveying is that it affords the student a means of practicing his profession during the vacation following this course. By continuing his course by means of summer work, the student not only acquires familiarity with the surveying and skill in its performance, but he also has an opportunity to view engineering work at close range, and to become interested in the practical details. In his later studies he will have a better grasp of the subject and a better appreciation of the relative importance of different parts of his work. Not the least important of the benefits to the student is the acquaintance he makes among engineers in practice.

Apart from the practical value of surveying, both as a part of civil engineering and as a means of making a start in the profession, there is a teaching value in surveying which should not be lost sight of. The field work not only has many of the advantages of physical laboratory work, i. e., manipulation of instruments, study of errors of measurement, keeping clear and accurate records, etc., but it also taxes the ingenuity of the student in overcoming practical difficulties. There is such a variety of problems and so many possible methods of solution that there is ample opportunity for the student to exercise his judgment and to develop originality in working out his methods of solution.

SANITARY ENGINEERING

(Continued from page 1.)

Basin project during their periods of active construction, as well as of various other enterprises of like character.

There is a class of undertakings, however, of somewhat recent development in this country, but of rapidly growing number and importance, the proper de-

sign and maintenance of which calls for more or less advanced knowledge of chemistry and bacteriology. Indeed, in the more important works, experts in these two branches of science must be consulted, and with them the designing engineer must co-operate. The works referred to are those of sewage disposal, works for preventing the pollution of streams by manufacturing wastes, and works for water purification. To fit a class of young men for effective service in these and related lines has been the main purpose in providing a special course in Sanitary Engineering, known here as Course XI, in which a substantial amount of chemistry and biology is provided, sufficient, it is intended, to fit the graduate to co-operate usefully with specialists in the design of sanitary works.

In most cases, though not always, the graduates of this course have gone into sanitary engineering practice, and a good idea of the field open to such men is afforded by a view backward over the successive classes and the various positions now held by their representatives. These comprise positions as assistant with prominent firms in private practice in Boston, New York and Chicago; others varying from that of Assistant to that of Chief Engineer with sundry state boards of health; positions as engineer, chemist or bacteriologist with sewage or water purification plants; engineering positions of various grades in city water and sewer departments, and with metropolitan and state water supply commissions; city health officers; professors of civil or of sanitary engineering; sanitary engineers in private practice; sanitary inspectors, etc.

There is no more fundamental or more generally useful branch of engineering than that classed as sanitary. The young man who enters it may expect to find a field for his highest efforts, and one in which he may be of great service to society.

HYDRAULIC ENGINEERING

By PROF. DWIGHT PORTER.

In so far as any engineer is concerned in a responsible way with the design or construction of works which have to withstand the pressure of water, or which are to convey, or measure water or to utilize it for power, navigation, irrigation and so on, he may properly be styled an hydraulic engineer.

The student of history who recalls the great aqueducts, reservoirs and canals built by the ancient Romans, Greeks, Egyptians and other peoples, will realize at once, then, that hydraulic engineering has long been practised, even though its early works were based upon a rather slender support of scientific knowledge. Even now our understanding of the physical laws which govern the flow of water is far from being complete and exact. Such as it is, however, it is to be acquired by the engineer from a study of the theory of hydraulics, a theory which must be supplemented for useful results by experience and experiment, the fund of which is forever being augmented.

The works in the intelligent design and carrying out of which the principles of hydraulics must play a part are of immense variety, however, including reservoirs, dams, gates, weirs, pipe lines, canals, tunnels, pumps, motors and other hydraulic machinery, stand pipes, purification works, locks, caissons, docks and a multitude of other structures. It is evident at once that they are too numerous and varied to admit of complete detailed study in the curriculum of any school, and that all that can fairly be attempted in any institution is training in the correct application of principles to the more common and typical structures, plus an incidental and moderate amount of teaching of allied features of practice. It is also evident that the success of many of the so-called hydraulic works mentioned is far more dependent upon correct knowledge of properties of materials and of the principles of structural and machine design than upon very complete knowledge of hydraulic laws.

Many graduates of the Institute are to be found in hydraulic engineering practice, those from the earlier classes as consulting engineers, and those from the later in the employ of private firms

(Continued on page 8.)

COBB, BATES & YERXA COMPANY,

SELL CIGARS, CIGARETTES,

SMOKING TOBACCO

AND ALL SMOKERS' MATERIALS

AT

55 SUMMER ST., CORNER OF CHAUNCEY

FASHIONS THAT PLEASE

and woollens that are specially selected for college men can be seen at either of my stores at any time, and opposite Tech. Union Tuesday's from 12 to 2.30. A students' tailor 14 years.

L. Pinkos

9 STATE STREET BOSTON HARVARD SQUARE CAMBRIDGE

BACK BAY BRANCH

State Street Trust Co.

130 MASSACHUSETTS AVENUE, BOSTON

Credits interest monthly on accounts of \$300 and over.

MAIN OFFICE: 38 STATE STREET

OWN A TYPEWRITER

If you haven't the cash we sell you one on

EASY PAYMENTS

WE HAVE ALL MAKES AND ALL PRICES

MODEL TYPEWRITER INSPECTION CO.

165 DEVONSHIRE STREET

26 ARCH STREET

SMULLEN & CO.

TAILORS

51 SUMMER ST., cor. Chauncey St.
Highest Grades : Popular Prices