GRADUATES' LETTERS

Answers to Letters Sent to Representative Men.

To the Editor of The Tech:

The following statement may be of interest, as an answer to your inquiry as to how my course in mechanical engineering at the Institute has been of value to me in my business.

While my business is a manufacturing one, my part of it does not require so much actual mechanical engineering as many others do, but certainly the training received at the Institute has aided largely in the forming of judgments when necessary in making alterations and improvements.

I feel that the greatest benefit derived from the course at Tech is the ability to keep my mind on a subject regardless of what is going on around me, as concentration of mind is of the utmost importance in handling many things simultaneously.

—G. L. Gilmore.

Contracting is one of the kinds of work for which training and experience in business as well as in engineering, make the best equipment if a man is to climb to the top. Contracting is highly specialized. Frequently twenty or more contractors, each doing one kind of work, will be found upon one job. Sometimes all of these are put under one general contract and sometimes engineers or architects assume these duties and let each kind of work directly. There is a growing (and praiseworthy) tendency to use what might be called an engineer contractor. This man finances the work, manages the operations of all sub-contractors and makes approximate prices, with guaranteed maximums if desired. The work is done at cost and the engineer contractor receives a commission for his services.

Whatever be the method of carrying out the work as laid down by engineer or architect, engineering skill is valuable and often necessary for the contractor. Obviously in some of the special lines others of Tech's courses are of more value—but Course 2 (mechanical engineering) is the most suitable equipment for the larger number. All kinds of contractors have machinery—in mills or shops and upon the construction work. Iron work, wood work and mason work, together with strength of materials, one must know much about. Walls, piers, arches, beams, columns and trusses must never present problems beyond appreciation. The combination of high quality and economy of output may often best be studied from an engineering poin. of view. Physics, mechanics, thermodynamics, etc., are often a great assistance—and that man builds his reputation who can "say why" upon the problem up for solution.

It is apparent that contracting covers many lines of activity. The range between an Eiffel Tower and the East River Tunnel, a North Dakota or Lusitania and a gian city building or millionaire's palatial home, is very wide. The smallest of this work— it may be a very small house, a comparatively insignificant piece of excavating or some other little thing—will often present its problems. It is a common occurrence to be able to watch the handling of men, materials and equipment of a contractor and see that he shows training in engineering lines. This training to a certain extent can be picked up outside but the best and easiest partial preparation for it is in Course Two at Tech.

Fred A. Wilson.

To the Editor of The Tech:

You have asked me to express my views upon the subject of "the mechanical engineer in the field of reinforced concrete," and it gives me pleasure to offer the following rambling thoughts on this subject.

It is rather difficult to determine exactly what the editor had in mind, but let us start with the idea that he wished my opinion on the value of a mechanical engineering education as a preparation for work in reinforced concrete. If this supposition is correct then I unhesitatingly say that the courses given in most technical schools under the head of "mechanical engineering" are not the best for a man who intends from the start to enter the field of reinforced concrete or any other line of structural engineering. The usual mechanical engineering course is not strong on such matters as "beam theory," "strength of materials," "structures," etc. and at least a fair working knowledge of these subjects is essential to successful design in either reinforced concrete or steel structures.

In general these subjects are covered much more thoroughly in the so-called "civil engineering course," and if a young man on entering a technical school, has already decided that the field of reinforced concrete or other structural work is without question to be his life's work, then he can probably more readily prepare himself for immediate usefulness in this line of work by confining his study to subjects usually classed as "civil engineering."

As regards M. I. T., however, I beg to suggest that "mechanical engineering" education as expressed in the work of Course II is far stronger on these subjects than is usually the case, and there is no reason why a graduate from this course should not "make good" in the reinforced concrete field, provided he is endowed with a fair amount of plain horse sense, which is an asset that cannot be conferred upon him by any college course and which is essential to success in any field.

Let me, however, urge upon the youngster just about to choose a course, not to undertake to determine just what special branch of engineering he is "going to take up on graduation." Ten chances to one before he completes his course he will make the startling discovery that there are other important special branches of engineering, which have been hidden to his youthful eyes and some one of them may lure him away from his first love. Moreover, the young graduate usually wakes shortly after receiving his diploma to the awful fact that there does not appear to be any immediate demand for men in the specialty he has picked out, and "filed upon" as his own. Soon hunger or some other powerful incentive induces him to accept (always temporarily) a position in some other field and then he congratulates himself or curses his instructors (rarely the reverse) according as his course of training has been along broad general lines or some narrow specialty. He now should realize that the fussy old "prof" who continually urged upon him the necessity of getting himself well grounded in the fundamentals even at the expense of his much cherished hobby, was his best friend.

A word more specifically as to the several engineering courses at M. I. T. To every young man who has a taste for things mechanical, who likes "to see the wheels go round," make things with his own hands and particularly if he has a taste for mechaanical drawing, I would say by all means, choose Course II. If wiring door bells, building telephone and telegraph lines or similar efforts seem to be the height to which only the elect may rise choose Course VI. If sighting through a transit or a level, climbing over rough paths with a rod or chain, or some day designing a roof truss appeals to the juvenile fancy, choose Course I, but whatever course you choose, don't for a moment lose sight of the fact that it is all engineering, and that the other fellow's work is "just as important and more so," and to a real naturol-born engineer, any problem in any branch of the profession is of interest.

To the writer's way of thinking there should be no distinction between civil, mechanical and electrical engineers until, after years of hard practice, men have proven themselves competent to specialize. What would we think if a medical school gave one man sourse of surgery and no therapeutics or vice versa? Would we care to consult an aurist or an oculist who knew nothing about the throat and nose? The only "doctor" who may be permitted to study one and only one specialty or to practice it without thorough and general training in all branches of medicine and surgery is the "corn doctor" and it is not necessary to say more as to his professional (?) standing.

Let us then do all in our power to eliminate the "corn doctor" equivalent from the engineering field and when we shall have done so and only then, can we demand for engineering admission to the ranks of learned professions. Breadth, breadth and more breadth should be our watch-word.

Howard L. Coburn.

STEAM TURBINES

Fourth Year Option Deals with Design and Construction.

By PROF. C. H. PEABODY.

The option of steam-turbine engineering was begun last year to meet a growing demand for instruction in the essentials of the design and construction of steam turbines.

This subject is so recent and the methods that have been evolved in practice have been so guarded, that textbooks and other publications give only the general methods with but little detail, either of computation or construction. The work of preparation of the option has been largely the evolution of

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MARINE ENGINEERING.

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the engine; (4) the computation of stresses in those members and the determination whether the engine is properly proportioned.

The methods outlined above are those used in marine engine establishments, and differ from actual practice in that the educational methods must be emphasized and the time given to elboration of detail, especially in the drawing room, must be minimized. Having such an investigation for a series of engines, the designer can readily so adjust the factors for the simple approximate methods as to control his design.

The drawing-room work includes the design of a propeller for the engine selected for design and computation; the drawing of the reciprocating parts, piston, rod, crosshead and converting-rod, and the determination of weights; an assembly drawing sufficient to determine the adequacy of the design; and the general arrangement of engine room.

The option includes also the discussion of the vibration of ships on account of the pulsation of the engine and of the methods of balancing enines to minimize that effect.

MECHANICAL ENGINEERING.

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of mechanism, he is given work which is intended to familiarize him with accepted conventions of representation and certain standard machine details such as bolts and nuts, screws, springs, keys, pipe-fittings, etc. Each student is furnished with a set of plates and tables giving the sizes and proportions of such of these machine details as may be considered standard, and in working from these data sheets he gains some practice in machine detailing preparatory to the course in machine drawing, and he also acquires a certain sense of the proper proportions to be used in machine designing.

In all the courses a definite number of hours is allotted to each problem or assignment of work in order that the student may form an idea of the amount of time that would be needed by a practicing draftsman to accomplish the same work. Failure to get drawings finished before a fixed date, allowance having been made for some overtime, influences the student's record of standing. Effort is made to teach the students to think clearly and to execute their work accurately, but this in a reasonable length of time.

A system of approving drawings has been adopted which promotes more thoroughness on the part of the students and which takes the place of the system of checking now so generally in use in modern drafting rooms.