

and otherwise, may have operated to reduce the average return below the level established for other enterprises. Yet, however this may be there is unquestionably an ultimate limit, and, whether or not it can be ascertained or even expressed in any but the most general terms, no student of transportation can afford to ignore its existence.

In conclusion the writer may be permitted to indicate the direction of some of the practical applications of the theory that is here suggested. The most obvious bearing is upon the desirability of railway agreements for the suppression of competition among lines connecting the same points, and for the maintenance of rates. It is certain that if railway rates tend naturally toward a minimum in the establishment of which the cost of operation is an important element, the enforcement of wasteful competitive methods of administration is undesirable, as the costs of such methods must inevitably become a charge upon traffic. It will probably appear also to have considerable force in determining the economic desirability of extensive corporate consolidations and the degree and character of state control over rates. The method to be adopted for the taxation of railway property would appear to be affected as, if the conditions of railway transportation have been correctly interpreted, such a tax must be distributed among railway patrons.—H. T. Newcomb, in the Yale Review.

Washington, D. C., Census Office.

AFTER GRADUATION—WHAT NEXT?

Mr. George M. Basford, in a recent lecture before the graduating class of Purdue University, made some practical and helpful suggestions. He said in part:

"You are soon to come to the decision: 'What next?' and I am safe in saying that you do not all know your possibilities, and that comparatively few know just what you are best fitted for. It is specially important, under such circumstances, to seek opportunities rather than positions. To decide to take your courses was an important step in that it was the acceptance of a long, hard task. The sequel comes after graduation, when more long and hard tasks are accepted, for the sake of preparation for advancement. In these the stimulation of the examination is lacking, and grit, patience and earnest purpose are required, because no letting up can be permitted.

It is well to be informed as to what others are doing. Study their work in its bearings upon your own, and use the ideas of others as improved upon by yourself. The technical press may be made a factor in your experience if properly used, and you can help yourself by the right sort of reading. It is a

good plan to acquire experience in writing. A well-considered article in a technical journal of high standing once or twice a year brings the writer's name into pleasant and profitable prominence, and a good paper on a vital subject read before one of the technical associations is exceedingly helpful in acquiring and extending acquaintance. It is a serious mistake to neglect opportunities of this kind. The writer also profits directly because he crystallizes his own opinions in telling them to others. The reputation gained by having one's name at the head of good articles on important subjects is not to be despised. If you think you cannot write well enough, perhaps some editor will be glad to help you. Whether you write papers or articles or not, subscribe for the best technical papers and join an engineering association or railroad club. If you have an association here you should use it.

Not Sufficient to Know.

It is not sufficient to know something, it is necessary that others should know that you know it, in order to open the opportunities for which you are prepared. Many complain that they are not consulted and that they have no chances, being kept in the same old ruts and not entrusted with important and interesting matters. Doubtless such a situation would be changed by well-considered suggestions to superiors, carefully worked out and presented in finished form. One may urge and argue with his superiors, hoping to induce them to take up some improvement, but if put in the form of a complete scheme, with perhaps alternatives, the arguments, even if not successful, will carry an impression of ability and earnestness which will not be lost.

Beginners have no voice in determining their relations with their superiors, but as you will soon have responsibilities over the work of others, a study of organization is necessary. Ideal organization is represented in military and naval affairs, where every officer is prepared for advancement, and is educating his own successor. In these fields there is never the slightest difficulty in finding men prepared for advancement, and yet how this lesson has been lost in many mercantile and railroad organizations! The constant stream of inquiries received at our office for men qualified to do this and that, from draughtsman to superintendents of motive power, testifies to a serious weakness, to which proper attention cannot be too quickly given. Railroad officers should be made to see that they are generally fatally deficient in their methods of securing their subordinates and in their treatment of them. The writer has been asked by railroad officers to recommend men for certain positions of responsibility under them, and has sometimes suggested the promotion of men already in subordinate positions in the same department. The

results were most satisfactory, but it is a sad reflection upon intelligence and even honor when promotion of faithful and capable men is not uppermost in the mind of the chief in such a case.

Chances for Young Men.

There was never a better time for young men to enter locomotive work than now. For years the chief improvements have been in the form of increased weight and size, and motive power men have generally found the problems presented by the traffic and passenger departments more important and more pressing than those affecting economical operation. The demands for fast and heavy trains are growing not less, but more severe, and the development in size and weight has been carried to a point which compels attention to economy for its own sake, and also because of the fact that increased economy means increased capacity and more horse-power without exceeding the limitations of clearance and weight. The question now is, as put by Mr. E. M. Herr, how to enable a fireman to shovel more horse-power into the firebox. The fireman's limit has been reached and in some cases passed, and this fact seems likely to exert a most important influence on the future design of locomotives. The desire to postpone the day of two firemen on a locomotive has already led to the consideration of the wide firebox. One after another of the improvements which have marked the progress of other branches of steam engineering will probably come up for consideration for the same reason, to relieve the fireman, and, also, to increase the capacity of the locomotive. This will probably mean much for the locomotive and also for the young men who prepare themselves to take a part in its future development. A total weight of 250,300 pounds for a locomotive has been reached, the wheel loads are probably as high as they can go with present construction, and recently the boiler of a well-known high-speed passenger locomotive of a western road has been adopted without change for a heavy freight engine of an eastern road. The locomotive is clearly in a most interesting stage, and it offers a worthy field for the best of talent. The questions are difficult, and they call for knowledge, ability, experience and business judgment.

Work for Engineers.

Engineers have always been consulted as to what certain things will cost; they are now also asked whether projected schemes will pay, and the most successful engineers are those who can answer both questions. It is necessary to acquire ability to see what should be done and to render opinions to practical, hard-headed men, which will convince them. Technical consideration should be used to form opinions, but they