

and also to prevent water which might enter above from working down into the larger mass below. Accompanying these dams, underground horizontal drifts might in some cases be put into the slopes to drain the ground.

THE CONSULTING ENGINEER AND THE MUNICIPAL ENGINEER.

By H. C. H. Shenton.

THERE should be no antagonism between the consulting engineer and the municipal engineer. They are both members of the same profession, and for that reason should carefully study their common interest. Signs are not wanting that the time is ripe for combination among engineers with the object of improving their standing and general welfare, and a paper read by Mr. Shenton before a meeting of the Institute of Municipal Engineers in London, on June 25th last, has for its object the furthering of such co-operation.

There is absolutely no difference in status between the two branches of the profession. We are all engineers, we all start level, we all receive much the same education and training, and eventually elect to specialize or to take up municipal appointments, or work in some other branch of the profession not under present consideration. Without doubt, a great municipal engineer of long experience is a better man professionally than a consulting engineer of smaller experience, and similarly a great consulting engineer is professionally of more importance than a municipal engineer of lesser attainments. This may be a truism, but it needs to be understood properly in order that, when they have to work together, the senior man (as regards experience and attainments) should take the lead without any feeling on the part of his friend, the consultant or salaried official, as the case may be, that he is being treated with want of proper consideration.

The Engineer's Qualifications.—The combination of all classes of engineers into one body is not beyond hope, but the combination of engineers of a particular class should not only be quite possible, but may well be attempted at the present time. For instance, all engineers holding municipal appointments could combine very easily, but in the author's opinion such combination would be incomplete, because it would leave out a very large number of men who advise as to the construction of some of the most important works of local authorities—viz., the consulting engineers. A difficulty at once presents itself as to who should be included in such an organization and who should be excluded. It is not to be denied that there is a certain number of consulting engineers whose experience does not entitle them to call themselves "specialists," and whose knowledge of the subjects upon which they undertake to give advice is inferior to that of the average municipal engineer; persons whose knowledge on all matters not pertaining to municipal work may or may not be great, but who are looked upon with considerable disfavor, and justly so, by those municipal engineers with whom they may have to work. Any man, however limited his knowledge may be, is at the present time able to write the letters C.E. after his name, take an office and give advice, and if he possesses influential friends and a plausible manner he stands a good chance of obtaining work with which he is quite unqualified to deal. There ought to be some method whereby such per-

sons should be prevented from advising as to the spending of public money. On the other hand (and it is necessary to be perfectly frank) there are many persons holding positions in municipal or district council offices who by no stretch of imagination can be considered worthy of the title of "Engineer." In the author's opinion a district surveyor is, or should be, an engineer; yet in small urban and rural districts, and even perhaps in some boroughs, where the salaries paid to the district surveyors are too small to tempt experienced men to act, men of a very inferior type as regards experience are frequently employed. Ignorant councillors are frequently of opinion that if a man is a good bricklayer or tradesman he is an engineer, and they employ him as their surveyor partly from motives of mistaken economy, and largely because they prefer to have someone to whom they can dictate, and whom they will treat with very little respect, thinking that thereby they, being omniscient in all matters pertaining to the surveyor's department, may have the ruling hand. In this way the dignity of the engineer's position is lowered, and an enormous waste of public money takes place.

The properly trained and qualified man, whether he is a municipal or a consulting engineer, looks with considerable dislike on the two classes of amateur engineer mentioned, and he would like to see the profession so organized that the incompetent person should find it as difficult to call himself an engineer as to call himself a lawyer or a doctor. However, on this point one must carefully avoid coming to a false conclusion. There are many good engineers whose early training was that of a different calling, but who possessed such ability that they forced themselves forward, gaining experience, it may be, in a very humble station, and finally taking their places in the profession as honored members with absolute justice. It is therefore necessary to consider whether many of the men who cause so much annoyance by undertaking work for which they can show no proper qualifications, and by doing it for an entirely insufficient remuneration, are not often persons of considerable ability whom it would be difficult and unwise to treat as being completely outside our ranks. The very fact that they possess the assurance to undertake engineering work suggests the possession of one of the qualities most necessary to all engineers—viz., pluck. These men, whatever their previous condition may have been, may be quite capable of gaining the necessary experience and training to qualify them as engineers, but till they have done so, whatever their age and position may be, they can only be regarded as juniors, and should be treated accordingly. In that case the local authority who tried to employ such unqualified persons in chief positions, or as consultants, should be prevented in the same way as they could be prevented from appointing a medical student to the position of medical officer. Leaving out of our consideration the inexperienced class of men on both sides, we may consider the remainder as belonging to one class, and these ought to be able to unite for their common good.

The Engineer's Remuneration.—The most important question at the present time is that of remuneration. No engineer ought to be made to work for insufficient payment. The municipal engineer is sometimes a perfectly competent specialist, and can advise his council better than any consultant upon a given matter outside his ordinary duties, but when he does so without receiving proper fees such as the consultant would charge he is doing the profession serious harm. He is ranking himself with a sort of consultant who prepares schemes for