

be combined with constructional work of as varied a character as possible. On the other hand, the young man who is articled to an engineer in consulting practice would probably see a greater variety of work than one articled to an official engineer and would be more likely to eventually become a designing and constructive engineer rather than adopt an official position. The relative advantages of the two methods are probably about equal, and both can be recommended.

If, however, the young engineer does not article himself to a waterworks engineer he should at least become the pupil of some engineer who is engaged in works of a similar character, such as sewerage, land drainage, irrigation, canals or dock works. After serving his time he should in this case at once endeavor to obtain an appointment in the office of an engineer of a water undertaking, in order to familiarize himself with the routine work of a waterworks engineer's practice.

A Waterworks Diploma?

Connected with this subject is a further question of whether or not it is desirable that there should be a special qualification or diploma in waterworks engineering. In the writer's opinion it is desirable that such a diploma should be instituted, but it should in the first instance be looked upon as a purely voluntary test submitted to by the candidate of his own free will. It should be regarded as supplementary to, and not a substitute for, associate membership of the Institution of Civil Engineers. The case of medical officer of health may be taken as an analogy; thus, a medical man who intends to take up public health work, after obtaining his ordinary qualifications to practice in medicine and surgery, usually takes the D.P.H. qualification as a further indication that he is capable not only to act as a medical man, but is specially well qualified in public health matters. A diploma such as this has obvious advantages, one of the most important of which is that it gives the young engineer a definite goal to work for, and compels him to study more deeply than he otherwise would do the special subject in which he is interested.

If, as the result of this discussion, there is a general feeling in favor of a special diploma, it is suggested that this institution is the proper body to act as the examining authority and that it behoves the council to take steps to that end. If hereafter such a diploma became compulsory, the institution, being already in the field and equipped with suitable machinery for carrying out an examination, would most probably be accepted as the proper medium for continuing the examination and granting the statutory diplomas.

The following discussion took place after the presentation of the above paper:—

H. C. Head (Winchester) apologized for the unavoidable absence of H. C. Adams, the chairman of the Joint Committee on the Status of Water Engineers. He knew it was that gentleman's intention to be present if it were possible. He would like to say that the committee was absolutely at one with the views expressed by Mr. Silcock. At the last meeting of the committee, on May 22nd, the members had no inkling of what Mr. Silcock was going to say in his paper, but the minutes of that meeting contained the following item: "It was unanimously resolved to invite the council of the Institution of Water Engineers to consider the advisability of establishing a standard examination for water engineers on the

lines already suggested for the final (practical) examination, but also including a *viva voce* test, the chairman accepting the committee's invitation to draft the terms of the letter." He (Mr. Head) believed that the institution had not yet received that letter, but, if so, it would receive a definite request in due course. He thought it was nothing short of cruelty to take a boy from a public school at seventeen or seventeen and a-half years of age and expect him to listen to lectures from 9 a.m. to 5.30 p.m. every day of the week and half-day on Saturdays. That excluded workshop practice and so-called practical work which was common in the technical colleges at the present moment, and which he (Mr. Head) regarded as valuable, not so much as teaching a boy, but as a means of giving him some mental relaxation. It was imperative that a boy who was going to live an outdoor life should be a good sportsman. What chance would a lad have of taking part in sports who was at work from 9 a.m. to 5.30 p.m.? His summer holiday was to be limited to four weeks, and in the sporting seasons he was only to have one week at a time. He was rather afraid that if they followed Mr. Silcock's advice they were going to overdo the poor boy. He was very glad that Mr. Silcock included *viva voce* examinations. If he might go a little outside the scope of the paper, he would like to say a word or two on the question of qualifications of engineers generally. The Institution of Civil Engineers seemed to have taken up the education and training of civil engineers fairly well up to a point. They had a school for studentship which was excellent, providing

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COST OF THAWING WATER SERVICES WITH ELECTRICITY

AT the recent convention of the American Water Works Association, considerable information regarding last winter's experiences with frozen water services was brought out in the discussions. The costs of electrically thawing services in several of the cities are shown in the following table:—

	Per service.	Remarks.
Paterson, N.J.\$	8.20	Includes all expenses and overhead.
Madison, Wis.	10.00	Charge for thawing.
Kitchener, Ont. ...	2.00	Current 50c. per service.
Peterborough, Ont.	2-2.50	
Niagara Falls, Ont.	10.00	Charge by electric company.
Green Bay, Wis. ...	3.50-12	Electric Light Company charged \$1.50 per hour for current and \$3 per hour for man.
New Rochelle, N.Y.	15.00	Charge by electric light company.
Trenton, N.J.	7.50	Water Department.
Gary, Ind.	3.00	By city; electric light company charged \$10.
Lawrence, Kan. ...	3.25	Current 10c. per hour; 1 man at 60c., 1 man at 35c. and 1 man at 25c.
St. Louis Co., Miss.	6.58	Current \$1 per connection and 75c. per hour for man.
Minneapolis, Minn.	5.00	City outfit.