

and Color, is the Critic, being ably assisted by the lady who has charge of the Methods of Teaching Form, Penmanship, and Drawing. The work of criticism was done fearlessly, every point being fully dwelt upon.

Spending, as we did, two days in this school, we witnessed many of the exercises both by members of the Faculty and by students in training. We have no hesitation in saying that more practical good may be obtained by visiting this school than by wandering about from school to school.

*Buffalo.*—The work done in this school is not unlike that done in Oswego, though possibly the criticism is not so searching; this may be owing to the fact that the Critic—a lady—is a new addition to the Faculty. Besides the criticism given by the Critic on work done before her in the Normal School and in the School of Practice, the student is subjected, as with us, to criticism by the teacher of the class. We witnessed work in several classes, and in the Drawing class found the students drawing from models made by themselves.

#### REMARKS.

In attempting to estimate the success of these schools, and in comparing their work with ours, it must be remembered that their session extends over a period of two years. They profess, as we do, to take up their academic work from a teacher's standpoint; that is, to present each subject as it is *to be taught*, and in the way in which it ought to be taught. The object, then, is to have the students, in learning any subject, learn also the best form in which it can be placed before pupils. This work is most successfully carried out. As far as time permits our Normal Schools do just as good work in this way. Making due allowance for our short time we do as much as they. We are of opinion, however, that the best results in this way can be attained only by making one session in the year in our Normal Schools—January to December, with July and August intermission; January to June, inclusive, Academic and Professional combined; September to December more strictly professional work. When the plan of reviewing the subjects of the Academic or Non-professional course was introduced into the Normal Schools, it was so introduced because it was found necessary to do so. The time was then extended. A further extension is necessary in order to have good work. Each school could take 120 students and thus keep up the number.

In connection with the review of subjects from a teacher's standpoint, we notice the importance attached to the topical arrangement of the matter. This seemed to work well.

The professional training in these schools, especially the Oswego one, was really training. The plan of giving a student a whole month, or a whole week, or even a whole day, at teaching is very much better than our plan of having an hour or two each day. This broken manner of carrying on the practice tells against our students, and the mixing up of subjects of non-professional study with this work spoils both. If a whole day were given once a week it would be better.

We notice particularly their system of notes on lessons, their criticisms—those of the students and of the critic teacher—and have learned much from these. In Oswego, the care taken in criticising the lessons cannot fail to make good teachers.

In the State of New York each principal receives a salary of \$2,500. In Boston the principal of the Normal School has a salary of \$3,800, while the principal of the Training department, who teaches two hours per day—the morning being devoted to routine work and oversight—enjoys a stipend of \$2,880. In the other schools of Massachusetts the salary of the principal averages \$3,000.

Know how sublime a thing it is,  
To suffer and be strong.—H. W. Longfellow.

## Special Articles.

### THE STUDY OF SCIENCE.\*

When a student has mastered the propositions of the First Book of the Elements, he may then learn how they may be applied both in the demonstration of Theorems and the construction of Problems. If the construction of Problems does not readily appear from the principles, let the analysis be attempted. Construct the diagram which represents the data and *quæstia*, and suppose the *quæstia* known, and trace back the steps which connect the *quæstia* with the data. When this is effected, the reverse of the process constitutes the solution of the Problem.

A correct diagram will be found most useful in suggesting the steps by which a Theorem is to be demonstrated. If the student will ask himself why he takes any particular step, he may avoid the habit of random guessing, and will more certainly discover the correct and direct process for effecting the demonstration. In framing a demonstration, that form is the better which proceeds directly or indirectly from principles, with the aid of a correct diagram. When a Theorem admits of more than one form of demonstration, that form is to be preferred which is the least tedious.

It should be remembered that Cambridge is not an infirmary for the weak and feeble-minded, but an Intellectual Gymnasium, where a student may develop and strengthen his mental powers by a course of disciplinary studies in the languages and sciences.

The following opinions describe the utility of the Mathematical Sciences as the best exercises for mental discipline:—

Roger Bacon considered that logic was to be dethroned, and its position replaced by two other subjects, which he regarded as the portals of all knowledge, the study of language and the Mathematical Sciences. He assigns to Mathematics the foremost place. Divine Mathesis (he writes), and she alone, can purge the intellectual vision, and fit the learner for the acquirement of all knowledge.

Lord Ashburton, in a letter, has stated that "Geometry will afford to the young lawyer the most apposite examples of close and pointed reasoning."

Professor Leslie has remarked that "the Demonstrations left by the Greek Geometers are models of accuracy, clearness, and elegance—admirably calculated for training the minds of youth to habits of close reasoning and luminous arrangement."

The late eminent Lord Chief Justice Cockburn, a member of Trinity Hall, made a passing remark in one of his late charges, to the effect that Euclid's Elements was a mental training second to none.

The late Rev. Dr. Chalmers has stated:—"I am not aware that as an expounder to the people of the lessons of the Gospel I am much the better for knowing that the three angles of a triangle are equal to two right angles: or that the square of the hypotenuse is equal to the squares of the two containing sides in a right angled triangle. But I have a strong persuasion that both the power to apprehend and the power to convince may be mightily strengthened, and that the habit of clear and consecutive reasoning may be firmly established, by the successive journeys which the mind is called on to perform along the pathway of Geometrical Demonstration. The truth is that, as a preparation, whether for the bar or for the pulpit, I have more value in Mathematics for the exercise which the mind takes as it travels along the road, than for all the spoil which it gathers at the landing place."

The opinion of the late Dr. Whewell, Master of Trinity College, is to the same effect:—

"When a demonstrative science has once been thrown into a rigorous logical form, it possesses a permanence and solidity which eminently fit it for being an element of intellectual education. Euclid's Elements are, to this day, at the same time the best scientific treatise, and the best instrument of mental discipline, which we possess.

\* Extract from Preface to New Edition of Potts' Euclid, furnished through the kindness of Robert Potts, M.A., Cambridge, England, author of "Potts' Euclid."