

Each study is constantly arraigned for judgment, as it were, and is compelled to answer two questions; namely, what faculties of the mind is it calculated to develop? and of what practical use are these faculties? I am well aware that this is no new theory, and that every real educator is constantly striving to incorporate those studies into a system of education and to invent such methods of instruction as will give the maximum practical mental discipline to the masses. There is one branch of education, however, that has not received its due share of consideration in this particular. I refer to the study of drawing. I would have this study subjected to the same tests and stand or fall precisely as I would have every other. But I would not have the instruction in drawing violate every law of development and all our efforts turned to the mere production of apparent results, while the main and only legitimate end is lost sight of entirely.

In order that we may apply the proper tests let us enquire: 1st. What drawing is? 2d, how we may learn to draw? and 3d, of what use a practical knowledge of drawing would be to the masses in the ordinary pursuits of life?

1st. Drawing is the disposition of lines upon a flat surface in such a way that when seen they create the same sense impression as does the object which they represent.

2d. We see by rays of light entering the eye and impinging upon the retina, these form an image of that from which they are reflected. This image is flat and is composed of masses of different colors and different degrees of light, and because it is an image it cannot be like the object which it represents unless that object is a flat surface and parallel to the surface of the image. The picture of an object is flat and because it is so its normal position is parallel to the retina, and because it is parallel to the retina the image of the picture will be like the picture itself. Learning to draw then is a development of the mind to an appreciation of the significance of the arrangement of lines upon a flat surface in such a way that their image upon the retina will be like the image of the object which they represent.

3d. Since written or spoken language is quite inadequate to describe the form and position of even very simple object, and since drawing is the language of form its office is to assist written language when it is most deficient. The practical advantages of a knowledge of drawing are general admitted, but I think that we do not begin to appreciate the advantage it would be to every one, and particularly to the mechanic and laboring classes if they had a command of drawing sufficient to enable them to describe form readily and with precision. The artisan's whole business is dealing with form and all sorts of makeshifts are resorted to and much valuable time is lost in attempting to convey ideas of form which a few strokes of the pencil in the hands of one who could draw, would make most plain. Furthermore drawing is a highly important factor in the education of the manufacturing classes, because, as the study and practice of drawing is a study of form and its description, it trains the mind to a higher appreciation of the beauty of form and the value of the harmony of proportions. There are hundreds of thousands of people who have daily and hourly need of a knowledge of drawing but who do not have occasion to write a dozen lines a month.

Every one will admit, I think, that it would be difficult to over-estimate the advantage of a practical knowledge of drawing; but there is a wide spread and firmly-rooted prejudice that such a result of teaching drawing to every pupil is impossible in the time that can be devoted to it in the common schools, if it is possible at all with any amount of time. It will be found upon examination that there is a striking analogy between the mental processes of learning both to read and to draw. Each is a training of the mind to the appreciate the form and significance of the arrangement of images upon the retina, which in no wise resemble that which they represent. In both the physical eye and hand perform the offices of mechanical contrivances. The mind interprets both the form and significance of the images upon the retina and directs the hand in the reproduction of these images. If the mental processes of learning to read and to draw are so similar, then the methods of instruction should be similar and must deal with the mind and not with the eye or the hand. The teaching of reading is the more difficult, however, as the child tries to learn, not only the sound and significance of thirty-six arbitrary characters besides various signs and marks, as well as the sound and significance of an almost infinite number of combinations of these characters and marks; but to learn them so well that they are recognized with the greatest rapidity and sounded with the greatest exactness. While learning to draw is simply learning to arrange lines on a flat surface in such a way that they when seen create the same sense impression as does the object when it is seen; or in other words it is simply learning that the picture is not like the thing itself but is the image of the thing seen reproduced upon a flat surface. Besides the fact that learning to draw is really a very simple process it has the advantage that every one desires to draw, while no one, or but few, have any desire to read, until they have learned how, and some-

times not even then; and because of this desire to draw as soon as this one point is made the mind begins to create mental pictures. If then learning to draw is a mental process so similar to learning to read, and if it has the advantages I have named there can be no reason why we do not attain to similar results in proportion to the time devoted to its study except that the methods of instruction are not adapted to the end sought. This is, I think, really the case since all the popular methods of instruction aim to obtain the desired results by copying, and since a picture is like its image the mind can not be developed by the e methods to comprehend the difference between the solid object and its image, and, therefore, but very few ever attain to any practical skill in drawing, and all are hampered by such study. Hence the skepticism and the high talk about art indulged in on the one hand by those who have looked for practical results of the teaching of drawing in the common schools, and on the other hand by those who had some patent method of wasting time and in the fruitless attempt to teach drawing by copying.—*Ohio Educational Monthly*

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How to Study Science.—The method of study is also important, and just here is where many otherwise good institutions fail. Every student of science should meet Nature at first hand, and learn to observe her phenomena for himself. Lectures and text-books are but minor accessories to study; in the sciences they play a wholly subordinate part; in the laboratory, the field, and the museum, the chief work is to be done. No matter what branch of science is to be pursued, the student from the very first must meet it face to face. The biological sciences ought to be studied in the field, collecting; in the museum classifying; in the laboratory, with the microscope and the scalpel. Far too often is the study of natural history degraded into a mere memorizing of classifications; as if the transitory part of science were more valuable than the permanent! The student must see, handle, dissect, and investigate, for himself. He is to study the phenomena of life, and not merely the external appearance of a lot of stuffed specimens. Chemistry, and physics also, is to be studied chiefly in the laboratory. It is not enough for a student to see experiments, he must himself perform them. Thus only can he learn the true scope of these great sciences. By a proper drill in qualitative analysis, he learns to observe closely, and to reason from his facts to their interpretation. Quantitative analysis gives him accuracy of manipulation, and an insight into the absolute value of experiment. This insight also results from delicate practice with instruments of precision in physics; a kind of exercise of the very highest educational value. If the course of study in any science can be capped by an original research leading to the discovery of new facts, so much the better. In a German university the candidate for a doctoral degree in science is absolutely required to carry out such a research, and to submit a dissertation upon it. This is not a severe requirement—every student who has been decently trained is able to come up to it, all the popular notions about the mysteriousness of scientific research to the contrary notwithstanding. Why should we not aim to equal the German standard?—*Prof. F. W. Clarke, in Popular Science Monthly.*

Manners.—Men succeed in their professions quite as much by complaisance and kindness of manner as by talent. Demosthenes, in giving his well-known advice to an orator—that eloquence, consisted in three things, the first 'action,' the second 'action,' and the third 'action'—is supposed to have intended manner only. A telling preacher in his opening remarks gains the good-will of his hearers, and makes them feel both that he has something to say and that he can say it—by his manner. The successful medical man, on entering a sick room, inspires into his patients belief in himself, and that hope which is favorable to longevity—by his manner. Considering that juries are scarcely personifications of peace and reason unmingled with passion or prejudice, a barrister cannot afford to neglect manner if he would bring twelve men one after another to his way of thinking. Again, has the business man any stock in trade that pays him better than a good address? And as regards the survival of the fittest in tournaments for a lady's hand, it is not a 'natural selection' when the old motto "Manners makeyeth the man" decides the contest. At least Wilkes, the best-mannered but ugliest man of his day, thought so. 'I am,' he said, 'the ugliest man in the three kingdoms; but if you give me a quarter of an hour's start, will gain the love of any woman before the handsomest.' If kindness of disposition be the essence of good manners our subject is seen at once to shade off into the great one of Christianity itself. It is the heart that makes both the true gentle-