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in this exhibition whereby every one may examine a great variety of the best models and diagrams. And precisely in the degree in which such opportunities are afforded, it is important that teachers of every class should endeavor to study their importance, and to adopt them in their several schools.

It is not my intention here to speak at any length on the subject of what may be called the highest class of models, in which machinery, or any other complicated conditions, are exhibited; because such models are only to be found, generally speaking, in the hands of those who are competent to use them, and fully illustrate their several properties. Such models are not attainable in ordinary schools, nor can they ever be largely applied in the general purposes of education. I would, however, observe, that one or two good models of mechanical construction, of a superior description, cannot fail to be of use, as examples of the highest class of illustration, and as a standard with which to compare the more elementary forms—and in works of art a few very excellent examples may be obtained at a moderate cost. For general use, however, in schools, models must be, as much as possible, of a simple and inexpensive kind, and it is to such as are within the scope of ordinary schools that I would now more especially advert.

The real use of a model is to carry the mind from the actual observation of a small object presented to the eye, to the comprehension of a larger object not presented to view, and in doing this the mind is necessarily employed in a study of relative dimensions, and of corresponding forms. Excellent models of geometrical forms, as the cube, &c., are to be had at a small cost; but in the smallest village school, unprovided with funds for the purchase of expensive models, much may be done at a very small cost—as for example, the construction of a cube, and other geometrical figures, may be explained by a piece of pasteboard, and the mode of construction is in itself an explanation of geometrical conditions; as for example, that the tetrahedron is bounded by four surfaces, the cube by six, and the pupils may with advantage be exercised in the construction of such figures. The instrument called a *goniograph* may be easily made by a country carpenter, or even by a skilful lad, and is well represented by the ordinary scales or rules used in France. It affords a ready model of various geometrical figures, and derives its name from Greek words, signifying to draw or describe angles. I am now adverting to the simplest forms of illustration, but which, simple and elementary as they are, we

**ON THE USE OF MODELS AND DIAGRAMS.**

*A Lecture delivered in connection with the Educational Exhibition, London, June, 1854; by T. SOPWITH, Esq.\**

My present object is to speak of **MODELS AND DIAGRAMS**, as applicable to ordinary use in schools.

Of these, models are the more valuable, inasmuch as they represent the solid form of an object, and can be viewed in any direction, whereas a diagram, even in its most pictorial form, only presents one aspect of the object; and if different portions of the same object are required to be shown, they must of necessity be delineated in separate diagrams. The portability and cheapness of diagrams, however, as compared with models, render them, on the whole, better adapted for extensive use in schools; and even the disadvantage of presenting only one face of an object may be turned to some account, and become a means of instruction, inasmuch as all the practical applications of drawing depend on a right appreciation of the laws under which solid forms can be represented on a plane surface.

The present time is more especially suited for some illustration of this subject, inasmuch as an opportunity is now afforded

\* By a reference to the Act published in the *Journal of Education* for last month, (page 86,) it will be seen that the Legislature has recently granted the sum of \$10,000 per annum for the supply of Grammar and Common Schools with Maps and Apparatus. See notice on page 112 of this *Journal*.