employed depend, and may, with a little application and reflection, learn a large number of them. On the other hand, anyone whose mind is well stored with geometrical truths will with ease solve a problem of construction insuperable to a mere rule of thumb practitioner. But whether or not it might be possible to separate these two branches of geometrical learning, my advice to you is, *link them together as firmly as you can.*

Whenever you have learnt a practical device for a geometrical construction *examine carefully the geometrical truths on which it is founded*; whenever, on the other hand, you have added a new theorem to your store of geometrical truths, ask yourselves, *What new problem does this theorem enable me to solve?*

To make my meaning clear I will take particular cases.

1. For my problem I will choose the very elementary one, *to bisect a given straight line.*

You are, of course, aware that the ordinary solution effects the bisection by joining two points, each of which is at the same distance from the two ends of the line to be bisected. This easily suggests *what repeated experiments would readily confirm*, that all points which are equidistant from the ends of a given straight line lie on a certain straight line which bisects the first. Thus the solution of our problem has easily led us to a theorem which should be stored up for the solution of future problems.

I am not aware of any treatise on practical geometry in which so much is done to direct the student to the general truths on which the art is based as in the little work by Mr. Pressland, of the Edinburgh Academy. It is a pity that this method is not more generally adopted; a treatise on Practical Geometry being often a mere set of rules without any method.

2. For my theorem, I take the one which tells us that "parallelograms on equal bases, and between the same parallels, are equivalent," and try to see what problems can be solved by means of it. (i.) It is easy to see that, given a parallelogram, we can construct on the same base another one, equivalent to it in area, and having two of its adjacent sides inclined at any given acute, right, or obtuse angle. (ii.) It is also easy to see that we can construct on the same base another one equivalent to it, and having one of its sides equal to any given straight line, of not less than a certain definite length. Our success may easily suggest that we can perhaps make one either (1) with its adjacent sides of any given length we please, or (2) with one side of any given length we please, and one angle equal a given right, acute, or obtuse angle, and on examination we find that we can, under certain limiting conditions, do both. [The solutions were indicated on the blackboard.]

But an inspection of the questions set shows that not only are you to be conversant with geometrical truths, but that you are to be able to give reasons *for believing them to be true.* Now *what reasons can we give for believing any geometrical statement to be true?* Examine this point rather closely. First notice that a geometrical proposition may generally be put into the form: *If A is B then C is D.* Thus, "The angles at the base of an isosceles triangle are equal" may be seen to be equivalent to "If two sides of a triangle are equal then the angles opposite them are equal." One method of convincing ourselves of the truth of this would be to make a large number of triangles, such as OPQ, in all having one pair of equal sides (OP, OQ) and verify-