

Logic Chaps. I.

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(X Logic as a Study of Signs).

A sign is something which stands for another thing to a mind. To its existence as such three things are requisite. ¶ In the first place, it must have characteristics which shall enable us to distinguish it from other objects. ¶ In the second place, it must be affected in some way by the object which it signifies, or at least something about it must vary as a consequence of a real causation with some variation of its object. One of the simplest examples of this is a weathercock, which is directly moved by the force of the wind. A photograph is caused by a radiant light from the object it represents. In the case of a picture executed by hand the causation is less direct, but none the less exists. The relation of a historical statement with its being is that of being caused by it. If a promise is made, this is a sign of the thing promised only so far as it will itself cause the existence of its being, unless we are to regard it as a prophecy which is caused by that state of the wind which will cause the thing prophesied to be carried out. Thus the causation may either be from the object to the sign, or from the sign to the object, or from some third thing to both; but some causation must be. ¶ The third condition of the existence of a sign is that it shall address itself to the mind. It is not enough that it should be in relation to the

object but it is necessary that it shall have such a relation to its object as will bring the mind into a certain relation with that object namely, that of knowing it. In other words, it must not only be in relation with its object, but must be regarded by the mind as having that relation. It may address the mind directly, or through a translation into other signs. In some way it must be capable of interpretation. We have seen that thoughts themselves have intellectual significance only so far as they prove themselves to other thoughts. So that thoughts are themselves signs which stand for other objects of thought. And since, on the other hand, there is no sign which the mind may not make use of in reasoning, it follows that the science of thought in its intellectual significance is one and the same thing with the science of the laws of signs. Now there are many general truths with regard to signs which hold good for all signs whatever, of necessity being involved in the essential nature of signs. The origin of these principles is undoubtedly the nature of the mind. But they are involved in so much of what is true of the mind as implied in our capability of reasoning at all and which may therefore be said to be implicitly taken for granted by all men, that is, to be deducible from what everybody agrees to and must agree before we can begin any discussion whatever in a rational way, and which is thus taken out of the special domain of psychology and made the common property of science. These principles might be evolved

from a study of the mind and of thought, but they can also be reached by the simple consideration of any signs we please. Now the latter mode of studying them is much the easiest, because the examination of external signs is one of the most simple researches which we can undertake, and least susceptible to error, while the study of the mind is one of the most difficult and doubtful. We shall therefore proceed in the remainder of this part of the work to compare signs, and generalize our result, being guided in doing so by a certain feeling of the necessity that this or that must be true, such as it felt in mathematics the origin of which necessity clearly is, in this case at least, that the principles are involved in the postulate, that the mind is so constituted as to investigate

The business of Algebra in its most general signification is to exhibit the manner of tracing the consequences of supposing that certain signs are subject to certain laws. And it is therefore to be regarded as a part of Logic. Algebraic symbols have been made use of by all logicians from the time of Aristotle, and probably earlier. Of late, certain logicians of some popular repute, but who represent less than any other school the logic of modern science, have objected that ~~Logic is the science of quantity, and exclusively~~ Algebra is exclusively the science of quantity, and is there-

fore entirely inapplicable to Logic. This argument is not so weak
that I am astonished at these writers making use of it, but it
is open to three objections: On the first place, Algebra is not
a science of quantity exclusively, as every mathematician ^{knows}
in the second place these writers themselves hold that ^{logic} algebra
is a science of quantity; and in the third place,
they, themselves, make a very copious use of algebraic
symbols in Logic.