VI.—DISCUSSIONS.

THE ARGUMENT *A FORTIORI*.

THIS discussion is assuming a very unusual character. Instead of the parties to it drifting farther and farther apart, and becoming more and more antagonistic, as happens in most discussions, the differences are narrowing and disappearing one by one, until complete harmony is in sight, if we may legitimately speak of seeing harmony. Let the galled jade wince at Dr. Schiller's and Mr. Sidgwick's contributions: my withers are unwrung. Their arguments are addressed rather to the orthodox logician than to me, and every bomb they explode in the shallow trenches of that futile person I applaud and rejoice at.

Dr. Schiller questions the use in this discussion of the words 'validity,' 'purpose of the argument,' and 'proof'. The last has not been used by me, but I will explain what I mean by the others. Of 'the notion of valid forms' Dr. Schiller says 'if it is to be taken strictly,' 'in the sense that their form guarantees actual truth to their conclusions, the validity of arguments *a fortiori* must certainly be denied'. I agree, but I have not spoken of valid forms, nor do I think this a legitimate or a customary use of the word 'valid'. By valid I mean conclusive or incontestable. This of course means a personal attitude towards an argument or a conclusion. That conclusion is valid for me which I cannot contest, but must accept. It does not follow that it is valid for others. The conclusion that the earth is approximately globular and turns on an axis is valid for me, and for most other persons who have examined the evidence; but it is not universally valid, for some people do not accept it. An argument may be generally valid in the different sense that the conclusions to which it leads are in most cases incontestable; but it may not be universally valid, for a case may be discovered, or by a (shall I say perverted?) ingenuity invented, in which the conclusion may be contested. Such are Dr. Schiller's cases of the hand being greater than the arm, and of the Armenian cheating the Scot.

There is no need for Dr. Schiller to impress upon me that many illustrations of reasonings are not real reasonings at all, but are merely verbal forms in which various real reasonings may be expressed. My withers are unwrung. These forms,

which Mr. Russell calls propositional functions, and Dr. Schiller calls forms-for-meaning, I call arguments without a purpose. Dr. Schiller's 'relevant to the context of the actual argument' is my 'material to the purpose of the argument,' and as far as I can discover we are, except in phraseology, in perfect agreement on this matter.

I should not agree, however, and I think that on consideration Dr. Schiller will not agree that if A is greater than B, and B is greater than C, then A may not be greater than C. I admit that if the difference were only microscopical, it might be truer for some purposes to say that A is equal to C; but then none of these purposes would be the purpose for which the premisses were stated. We should have stated the premisses for one purpose and applied the conclusion to another, a most illogical proceeding. If A, B, and C are iron girders some thirty feet long, and if the purpose of comparing them is to determine whether C is long enough to bridge a gap which it is known that A will bridge, then the difference of a few 64ths of an inch between A, B, and C is, as Dr. Schiller would say, irrelevant to the context of the actual argument, or as I should say, immaterial to the purpose of the argument; and for the purpose of the argument, A, B, and C may be regarded as equal. But in such a case, the difference between A, B, and C, being immaterial to the argument, would never have got into the premisses. No engineer in his senses would have said that A was longer than B, or B longer than C: for the purpose of the argument it would not be longer. If for any purpose those few 64ths of an inch do make a difference, as they may if we are estimating the elongation of the girders by the heat of the sun, then those fractions must be stated in the premisses, and then they must appear in the conclusion. They cannot be taken into account in the conclusion unless they appear in the premisses, but if they are sufficiently material to the purpose to be stated in the premisses, they must be taken into account in the conclusion. For one purpose, A may be longer than B: for another purpose A may not be longer than B; but as it is stated in the premiss to be, so must it appear in the conclusion. We are sworn to deliver a true verdict *according to the evidence*; and we may not violate our oaths by ignoring what is in the evidence, any more than we may violate them by taking account of what we have heard out of court. If, for any purpose, A is greater than B, and B is greater than C, then for that purpose A is greater than C; and this conclusion is not in the slightest degree invalidated by the fact that for some other purpose A, B, and C may be regarded as equal. As a pragmatist, Dr. Schiller should agree.

Consequently, the difference between the valid and the invalid forms is, in my opinion, not 'that in the former case we are more prone to think of uses in which the conclusion stated is true, while in the latter we think more readily of cases in which

the conclusion is false,' but that in the former we have a purpose, and stick to it throughout the argument, while in the latter we either have no purpose, or we change our purpose in the course of the argument, or we apply our conclusion to a purpose foreign to the purpose of the argument. Such a proceeding is of the nature of a practical pun.

'The general "validity" of a form is no protection against the falsity of a conclusion drawn in it in special cases.' This is true only as long as the form is used for no purpose, or if the purpose is changed. If the form is adapted to the purpose, and the purpose is kept steadily in view and not departed from, then a form valid in one case is valid in every other in which the purpose is similar.

Mr. Alfred Sidgwick's first question knocks the breath out of me. He asks 'Are there any philosophical reasons why this solution should be considered unsatisfactory?' The solution being the complicated universal for which he is partly responsible, and which is alleged to be required to complete the *a fortiori*. I have already (No. 97, p. 86) discussed this solution at length, and given at length my reasons for considering it unsatisfactory, and hence my breathlessness at Mr. Sidgwick's question. If he had challenged my reasons, I should have been on my defence, but as he does not refer to them, presumably they have made no impression upon him. He gives me, however, an opportunity to repeat them, and I will try further on to put them so as to attract his attention.

'There is no necessary connexion between validity of form and actual truth' (Dr. Schiller); 'the habit of trying to get a single formula which shall apply equally to arguments from facts and to arguments which are only an interpretation of words' (Mr. Sidgwick). Again my withers are unwrung. The distinction between validity of form and material truth, between arguments from facts and arguments that are only interpretations of words, is one which I may fairly say I have drawn more clearly, more completely, and more often than any other writer. It is drawn in my *New Logic* with a clearness, width, and insistence which it is beyond my power to increase. It is sharply drawn and copiously stated in the Introduction, and subsequently receives the greatest possible emphasis by the devotion of a complete and separate Book to each mode of reasoning. If my courteous antagonists mean their warnings for me, I suggest that Dr. Schiller would find it equally expedient to warn Mr. Sidgwick of the futility of traditional Logic; Mr. Sidgwick would be as usefully employed in trying to convert Dr. Schiller to pragmatism; and both of them would find an occupation equally useful in trying to convert the Pope to Roman Catholicism.

Mr. Sidgwick considers that my objections to the literary form in which the alleged universal is expressed are irrelevant, and asks what philosophical weight there can be in them, what pos-

sible relevance such literary criticism can have. I submit that they are strictly and directly relevant. I submit that suitable, clear, accurate expression is the first business of the logician; and that a logician who cannot express himself suitably, clearly, and accurately has not mastered the rudiments of his art, and is advertising his own incompetence in his own business. I submit that speech is the expression of thought, and speech which is confused, obscure, entangled, or muddled faithfully reflects the thought, which also is confused, obscure, entangled and muddled. In this matter I am heretical. I will never admit that what is unintelligible is therefore to be revered and meekly accepted as too profound to be criticised. On the contrary, I hold that cumbrousness, confusion or obscurity in a statement raises a *prima facie* presumption that the thought has not been worked out, and is probably erroneous; and this presumption is fully justified by experience. As an example I may adduce Mill's Canons of the Experimental Discovery of Causes. Every one can see that the third of these Canons is cumbrous, complicated, and obscure in the extreme; but it has been accepted with all the more reverence because it is unintelligible, and has been looked upon as the corner-stone of the Inductive Method. When it is carefully analysed, it is found not only to be erroneous, but to be nonsensical, and by no modification or amendment can sense be made of it. I do not say that the complicated attempts to formulate the universal result in nonsense, but I say that, generally, bad literary form means bad thinking.

Mr. Sidgwick asks me why I am surprised that the syllogistic expression of an argument is unnatural. I do not think I have expressed any surprise on such a score. I have certainly not felt any. 'The more acquaintance we have with the defects of Formal Logic, the less room is there for this surprise.' I agree with all my heart. The surprise would be if any formula of Formal Logic were susceptible of natural expression.

It is a serious irrelevance, Mr. Sidgwick says, for me to assume that because the reasons for the *a fortiori* conclusion are given in two propositions, etc., therefore they are 'the premisses'. Again I agree, but that is what they are commonly called, and sometimes one finds it expedient to bow oneself in the House of Rimmon. 'The question raised by Mr. Shelton is whether they do or do not together constitute the minor premiss only. We cannot solve this question by assuming the answer beforehand.' I agree: but I submit, in the first place, that so far from assuming the answer beforehand, I devoted a great deal of space to discussing it; and in the second place that, even if I had assumed the answer beforehand, this assumption, however illegitimate, could scarcely have been described as an irrelevance.

I am irrelevant also, I am told, in asking whether we do or do not reach a conclusion through a universal. I do not know what Mr. Sidgwick means by irrelevant, but it must have to him some

meaning very different from what it has to me. I cannot for the life of me see how it is irrelevant to ask the very question that I propose to discuss, and do, to the best of my ability, discuss.

I am charmed to find Mr. Sidgwick insisting on the difference between asserting that a conclusion is proved by the facts as given, and asserting that it *would be* proved if those facts were found true. This is the difference that I, too, have insisted on so strenuously in my *New Logic*, and again in the postscript to my last contribution to this discussion (No. 97). I never put a hypothetical argument of my own into categorical form, but in quoting, I am something of a purist, and in my quotations I feel bound to reproduce the *ipsissima verba* of my quotee, even if they outrage my tenderest susceptibilities. This is why I gave to formula (1) a categorical expression.

The first question in Mr. Sidgwick's final paragraph puts me in a very delicate position, for it seems to me to be founded upon that very confusion, which we agree in deprecating, between the hypothetical argument and the material argument. 'When we have a fact or facts asserted as sufficient to prove a conclusion, two questions arise before a sound decision can be reached. One is the question whether such facts are true; and the other is whether, if true, they are sufficient for proof.' So far I respectfully agree; but then Mr. Sidgwick continues, as part of the same argument, 'where a complete syllogism is set out . . . these questions refer,' etc. Here my agreement ends. Here I raise my protest. Up to this point we have been dealing with 'a fact or facts asserted' as true, and my contention is that the syllogism is powerless to cope with facts asserted as true. The syllogism is a part, a small and insignificant part, of the machinery of Inference, of the reasoning of consistency, which treats, not of facts asserted as true, but of suppositions. The categorical syllogism is, in my view, an illogical monster that exists only in the distorted imagination of misguided logicians. It is the logical Mrs. Harris, and for my part I don't believe there never was no such argument.

As long as we are using the syllogism, or any mode of inference, our arguments, as they are in fact hypothetical, ought, I contend, to be cast in hypothetical form, and to begin *IF* A is B, or as the case may be. Such arguments may be perfectly valid though their conclusions are untrue, nonsensical, or inconceivable. But if we are dealing with facts asserted as true, and if we desire that our conclusions shall be true in the sense of being in accordance with fact, arguments of this class are useless. If we desire to arrive at truth we must start with an assertion of truth, and our arguments must open, not with *If*, but with *BECAUSE*.

If, for any purpose, A is B, and *if*, for that purpose B is C, *then*, providing the relations signified by the copula are equivalent, the conclusion that A for that purpose is C is incontestably valid, and cannot be gainsaid. But though the conclusion follows

incontestably from the premisses, it need not be true. It may be false, absurd, nonsensical, or inconceivable. If an elephant is a triangle, and if this triangle is melodious, then an elephant is melodious. There is no flaw in this reasoning. The conclusion is uncontestably valid; but whether it is true or not is no concern of the argument. In the progress of this argument we run no risks and take no chances. Its form does guarantee the validity of the conclusion, in the sense that it makes the conclusion uncontestable, but the form has nothing to do with the truth of the conclusion.

If we are dealing with what is asserted as fact, and desire to arrive at truth, inference will not help us. We must now use a material argument, and must state it thus:—*Because* this A is found to be, in respects material to the argument, like B; and *because* every such B has been constantly in experience found to be C, *therefore*, provided our experiences of B's have been sufficiently numerous, we may take it that for the purpose of the argument this A also is C. In this argument we deal with facts, or with what has been asserted to be facts. We appeal to experience at every step, and at every step there is a liability to error. These are the arguments in which risks are incurred and chances taken. These are the arguments whose conclusions, provided all the material conditions are satisfied, must be accepted as true. The difficulty of satisfying all the conditions may be great—it may be insuperable; but if it is surmounted, the conclusion is true. By true, I mean first that it furnishes a basis for action, and second that action based upon it never brings us up against experience that contradicts it. As a pragmatist, Dr. Schiller should agree.

Material reasoning may be invalid. The A that is so like B may after all not be like B in respects that are material to the argument. Every B may not be a C. There may be B's not C's that we have forgotten, or overlooked, or have had no chance of experiencing, and A may be one of these. Our experience of B's may be insufficient to warrant a certain conclusion. In any of these cases if we induce a certain conclusion and look upon the conclusion as true, the reasoning is invalid. But the conclusion is not necessarily false: it may by chance be true after all. And even though all these defects may be in the premisses, the reasoning is not necessarily invalid. If we allow in the conclusion for the errors in the premisses, and state the conclusion as probable or possible, the reasoning is valid, though the conclusion may not be true. I trust these explanations will make it clear that I do not regard validity and truth as the same, and will make clear what I mean by validity and by truth.

If in the material argument the second premiss (*Because* every B has constantly in experience been found to be C) is called a universal, then every material argument does need a universal; but it is manifest that the experienced universal of the material argument is as different as possible from the postulated universal

of the hypothetical argument that we have been discussing, one variety of which is the *a fortiori*; and that things so widely different should scarcely be called by the same name.

Even in the hypothetical argument, of which the *a fortiori* is one variety, and the syllogism another and scarcer variety, I have no objection to the use of a universal if it is wanted; but my contention is that in many cases of these and other hypothetical arguments, no universal is wanted. Mr. Sidgwick's argument about the sides of the triangle can be conducted equally well both with and without a universal, and the detached universal to whose neatness of expression he calls my attention is never wanted and never used.

If BA and AC are two sides of a triangle, then BAC is longer than BC. Mr. Sidgwick says we obtain this conclusion through the universal 'any two sides of a triangle are together longer than the third side'. I deny that this universal enters into the argument. That is the plain issue between us. My contention is that as soon as I understand the premiss, and get it pictured in my mind, the conclusion is reached intuitively. I do not reach it through the neatly expressed universal. On the contrary, I reach this universal through the particular instance before me, if it is a particular instance. If I have never before seen, heard of, or imagined a triangle, I still reach the conclusion intuitively from the case before me; and if this is my first experience of a triangle, how can I have the universal already neatly expressed in my mind? But as soon as the conclusion is reached, I am in possession of the universal, and for this reason: that the premiss may be understood either particularly or universally. BA, AC, and BC may be taken for the specified sides of a particular individual or specimen triangle: but they may not be so taken. They may be taken for the sides of any triangle whatever, and if of any triangle, then of every triangle. In that case, to say that BA and AC are together longer than BC is to say that any two sides of any triangle are together greater than the third side. It is putting the same thought into different words, and you cannot prove a conclusion by restating it in different words, or by referring to a restatement of it. The neatly expressed universal 'any two sides of any triangle are together greater than the third' is explicitly universal: 'BA and AC are together greater than BC' is implicitly universal; and it is a mistake to suppose that one is more universal than the other, or that one is needed to corroborate and justify the other. 'A butterfly is an insect' is as wide a universal as 'Every butterfly is an insect,' as 'Butterflies are insects,' and as 'All butterflies are insects'. 'A butterfly' may mean a particular individual specimen of a butterfly, this very one, for instance, that is now flapping against my window; or it may mean the representative butterfly, the summarised verbal expression of all butterflies; and so it is with Mr. Sidgwick's triangle. It may be an indi-

vidual specimen of a triangle, such as I may draw on this sheet of paper, or it may be the representative triangle, and is then equivalent to every triangle. If it is an individual triangle, I want no universal. I can see for myself that this very BAC before me is longer than this BC, without mentally referring to all triangles or to any other triangle. If it is the representative triangle, then it is the universal triangle; then I am conducting my reasoning in universals; and then I have no need to state my universal twice over, or to invoke one statement of it in order to validate another. Why, even in the neat expression which Mr. Sidgwick presents to me as a universal he does not speak of all triangles, nor of every triangle; he says any two sides of a triangle. Very well; ABC is a triangle, and to say that BA, AC are together greater than BC is precisely the same as saying that two sides of a triangle are together greater than the third. The comparative neatness of the expression does not, therefore, reconcile me to the syllogistic expression of this argument. It is true that Euclid went out of his way to smooth the ice, and to prove the proposition; but he might as well have saved his breath to cool his porridge, for none of the self-evident data on which he bases his demonstration is more self-evident than his conclusion.

Jevons' suggestion to use the words *case of* is made, not in connexion with the *a fortiori*, but as a device to reduce the hypothetical to the categorical, an operation that I regard as, in the words of the prayer-book, utterly heretical and damnable. Mr. Sidgwick will find it in the Chapter on Conditional Arguments in the Lessons. In the fifth edition of 1875 it is on page 164.

Finally, let me say, in response to Mr. Sidgwick's closing sentence, that I do not agree. For reasons already given I will never agree that in any logical proposition literary defects are without logical importance. Logic is the science and art of reasoning, it is true, but as ancillary to reasoning it includes the science and art of expression. Unless thought is expressed suitably, clearly, and accurately, reasoning must be confused and imperfect; and it is easy to trace much of the confusion of thought that is rampant in logic as well as in other things to bad literary expression. I insist upon this the more strenuously because we have imported from Germany a cult of obscurity, and obscurity passes current for profundity, instead of being recognised for what it is, *viz.*, incompetence.

A reply is almost necessarily longer than the argument to which it replies, and a rejoinder longer than the reply. If I were to answer Mr. Pickard-Cambridge point by point, the Editor would use his blue pencil very freely, or I should occupy more pages of *MIND* than would be justifiable. Yet if I select certain arguments and confine my answer to them, it will naturally be supposed that I have selected those that are easiest to answer,

and have neglected the others because they are unanswerable. In this quandary I wrote to Mr. Pickard-Cambridge asking him to select three or four of his arguments which he considered the most destructive of my case and the strongest supports of his own, that I might restrict my reply to them. My letter did not reach its destination in time, for I have had no reply,¹ and therefore I must make my own selection from among his arguments. I select those that seem to me the most telling in his favour and against my position.

The most profitable way to approach the subject will be through the one point on which we agree. We agree that if, in the argument $A > B, B > C \therefore A > C$, A, B , and C stand for any magnitudes of the same kind, we see directly and immediately that the premisses necessitate the conclusion; but when A, B , and C stand for individuals, Mr. Pickard-Cambridge holds that we require a universal to validate the argument: I hold that we do not, and for the following reasons:—

Imprimis, in scanning the argument and assenting to the conclusion we do not pause to consider the signification, as universal or particular, of A, B , and C . It never enters into our heads to do so. We assent at once; and, to me at least, the argument is no more conclusive in the general than in the particular, no less conclusive in the particular than in the general.

Secundo. If we arrive at the particular conclusion through the rule, how do we arrive at the rule? I submit that there are but two ways. Either we deduce our rule from some more comprehensive rule, or we arrive at it by generalisation from particular cases. If we derive the *a fortiori* from some more general rule, what is that rule? Whatever it may be—for my part I deny its existence—it must derive from one of these two sources. Either it is deduced from a rule still more general, or it is a generalisation from individual instances. Whichever is the case, the same argument applies again, and we must ultimately come to a rule which is a generalisation. From generalisation all rules are derived, either immediately or at second or third hand; and if a universal rule is valid, it can be so only because the particular instances out of which it is constructed are valid. Not until the individual instances are appreciated and found to be valid does it occur to us to formulate a rule. If I have before me an A which $= B$, and a B which $= C$, I discern at once that A must $= C$, and I discern this before I have any rule in my mind. It is because I discern in this case that $A = C$ that I am able to generalise and formulate the rule that things that are equal to the same thing are equal to one another. It has happened to me, and no doubt to others, to try to drum the rule into the head of a stupid boy who cannot understand it. To drum it into his head I have been obliged to resort to an individual case. I have cut three

¹The reply was eventually received, but unfortunately not until my MS. was despatched.

slips of paper of the same length, marked them A, B, and C, and compared them by actual apposition; and I have found that though the boy could not appreciate the general rule, he saw at once the validity of the individual instance, and from this instance he was able to construct the general rule. I do not deny that there are cases in which we deduce the individual instance from the general rule, but I deny that the *a fortiori* is such a case. It may be that from previous instances we have the rule in our minds, but in a new particular instance we do not need it and do not use it. The new instance of the *a fortiori* goes to reinforce and corroborate the rule, and widens the scope of the generalisation; but the generalisation was derived from the particular instances, and not *vice versa*. How else can a generalisation be attained?

I freely admit that when we argue from a rule that we suppose is universal, and when it is shown that the rule is not universal, the argument is invalid; but I submit that this is not the case with the instances he adduces. 'Could we ever get beyond the deadlock in which one man says "I see such and such a conclusion emerging from these premisses" and the other says "Well, I don't"?' I do not think we could. I think the validity of the *a fortiori* is unarguable. If a disputant does not see intuitively that $A > B$, $B > C$ carries $A > C$, we must let him alone. If he does not see it, certainly no universal will enable him to see it. If we really are arguing from a general rule to a particular case, the objector has two lines of defence: 1. The case does not come under the rule; 2. The rule is invalid. If the *a fortiori* were indeed dependent on a universal, either of these defences would be open to us. As neither of them is conceivably open to us, I think we must conclude that the *a fortiori* does not depend on a universal. The first of these lines of defence has escaped Mr. Pickard-Cambridge's attention.

The argument with respect to the houses is faulty throughout, and it is no wonder that a reasoner so inefficient should come a cropper. If Peter's house is N of John's, and John's is E of Nathaniel's, it does not by any means follow, *a fortiori* or in any other way, that Peter's is N E of Nathaniel's. Mr. Pickard-Cambridge is careful not to father the argument himself, but puts it into the mouth of a friend. I think his friend has a legitimate grievance. In the circumstances supposed, it is infinity to one against Peter's house being N E of Nathaniel's. It may be at any point of the compass between N and E, or in limit, due N, as when Peter's is at the N pole, or due E, as when Peter's and John's are semi-detached, and Nathaniel's is a thousand miles away to the west. My contention is against a universal in the valid *a fortiori*: I did not contemplate such a wild creature as this.

The third of Mr. Pickard-Cambridge's arguments that I will select for rejoinder is that in which he refutes my contention that there is no universal in the *a fortiori* by showing that I

myself introduce a universal into an argument—that is not *a fortiori*. I should be reluctant to admit that the refutation is good, even if the universal that is found in my argument were what I consider a universal. I have never denied that there is a universal in some arguments, but only that there is one in the *a fortiori*; and I do not see that my argument commits logical suicide if I introduce a universal into an argument that does not pretend to be *a fortiori*. But is my second premiss a universal? Is the proposition 'Obtaining money by false pretences is cheating' a universal proposition? I do not admit that it is entitled, either in Logic or in common sense, to the distinction. In Logic, it is certainly not a universal proposition. It is indesignate. It does not say that *All* obtaining of money by false pretences is cheating, and if we are to be governed by Formal Logic, it is not a universal proposition. If Mr. Pickard-Cambridge abandons Formal Logic, I congratulate him on his escape from his Ruheleben, and welcome him to a feast of common sense; but if we are to be nourished on common sense, my premiss is still not a universal. It merely calls the same thing by another name.

I submit once more, therefore, that when it is said that the validity of the *a fortiori* rests upon a universal, the cart is put to draw the horse. When I have seen that in the cases stated, A must be greater than C, John must be taller than Nathaniel, the mongoose is quicker than a terrier, then I can generalise these instances and draw the rule of the *a fortiori*; but until I see the validity in the particular case, I cannot formulate the general rule, for there is no wider rule from which I can deduce it, and *ex nihilo nihil fit*.

Dr. Bosanquet will not think me discourteous if I postpone my reply to him to a future occasion.

CHAS. A. MERCIER.