

truth is when Dr. Mercier treats of desire. But then desire does not cover the whole field of emotion. It is a restricted emotion directed to the attainment or possession of an object from which pleasure is expected. It is a passion excited by the love of an object. I would place the feelings in the following order of intensity—emotion, desire, craving, their results being self-conservative, social and racial conduct.

If the readers of the *Journal of Mental Science* desire to experience an exquisite pleasure, to be stimulated to many new lines of thought, and to receive explanations of many obscure facts in their daily experience, they will read this charming and most illuminating book.

T. S. CLOUSTON.

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*Formal Logic: A Scientific and Social Problem.* By F. C. S. SCHILLER, M.A., D.Sc. London: Macmillan, 1912. Price 10s.

The whole history of literature presents no parallel to the almost simultaneous appearance of this book and my *New Logic*. The simultaneous presentation of Natural Selection by Darwin and Wallace was intentional and designed. Both had been working at the subject unknown to one another for years; but their agreement was known to Darwin, at any rate, before publication. Adams and Leverrier published almost simultaneously their discovery of Neptune; but the discovery was not, like that of Darwin and Wallace, the contradiction of a doctrine until then universally accepted; it was merely an application of a doctrine already in vogue. But that a doctrine that has been universally accepted for more than two thousand years, that has been received and passed on by generation after generation without question and without doubt for that enormous length of time, should at last be violently attacked root and branch, lock, stock, and barrel, by two antagonists within a month of one another, and without consultation, agreement, or collusion between the authors, is, as far as I know, entirely unprecedented.

The agreement is as close, in many respects, in point of matter as it is in point of time. Dr. Schiller and I both attack formal and traditional logic all along the line, in every principle and in every detail; we both find in it the same defects, the same futilities, the same contradictions; we both identify the same principles as those on which an efficient and valid logic ought to depend; we both use actually, in some cases, the same illustrations and the same allusions. We both call to our aid the story of the Emperor's clothes from Hans Christian Andersen.

Such an agreement seems to me highly significant. It seems to me to indicate the close of one epoch and the beginning of another. It seems to me to show that a revulsion against the doctrine and methods of traditional logic is "in the air." It seems to me that the fulness of time is come; that the generations and years and days of traditional logic are accomplished; that the time is ripe for a revolution; that the minds, not only of Dr. Schiller and myself, but of many others, are dissatisfied with logic as it is taught, and unconvinced by it; and that its downfall is at hand. If there are two who are so far moved by

a perception of the futility of logic as to write big books against it, how many more must there not be who are moved in the same direction, but to a less extent; whose dissatisfaction, perhaps not less profound, is less articulate; whose want of conviction causes them to pass it by with a shrug, or to long for someone else to undertake the task of exposure for which they do not feel the qualification, or do not possess the leisure! For the first time in its long history, Aristotelian Logic is on the defensive. It has now to justify its existence.

Bacon, it is true, rejected it; but he did not attack it in detail. He put it on one side as having led to no practical result. He did not attempt to show that logic did not, in fact, display and account for the way we reason. His argument was—"Let us give up attempting to show how reasoning is carried on, and turn our attention to the accumulation of facts." As an organon for the discovery of truth he derided it, on the ground that no truth had ever been, or could ever be, discovered by its means; but he never sought to show that the methods by which logic says we reason are not the means by which we do in fact reason, nor did he propose any other method of reasoning.

The Inductive School proclaimed themselves followers of Bacon; and they were his followers in this respect, that they held fast to the principle of attaining truth by the observation of fact; but in other respects they were reactionaries. The syllogism, which Bacon had rejected, was restored by them to its pride of place; and Mill was, in fact, as convinced as Aquinas, or Erigena, or Aristotle himself that truth was discovered by means of the syllogism.

The central doctrine of all reasoning, putting it in the widest and most comprehensive formula, is that reasoning is the bringing of a particular case under a general law. Thus stated, the doctrine would secure the adhesion of Dr. Schiller and myself no less than of Aquinas and Erigena and Aristotle. It is in our way of finding the general law, and of bringing the particular case under it, that we disagree with our predecessors. Traditional Logic lays down its general law, states its particular case, and has no difficulty in bringing the one under the other, for it takes any statement it pleases for a general law, and any statement it pleases for a particular case. By such means it is not difficult to take a valid argument on any subject; but we maintain that such an argument is a fake and nothing more than a fake, and does not follow the true process of thought. The position taken up by Dr. Schiller and myself is that in the actual experience of life such easy cases do not occur, but the whole validity and the whole difficulty of reasoning lies in finding, when a particular case is presented to us, under what general principle it can properly be subsumed; and when we think we have discovered a general principle, what particular cases may be brought under it and what may not. These are matters that Logic airily and completely ignores, and its neglect of them vitiates and nullifies the whole system of Traditional Logic from beginning to end.

The great importance and the great value of the complete agreement as to results between Dr. Schiller and myself lies in the fact that we reach these results by different methods. If an algebraic demonstration attains the same conclusion as a geometrical demonstration, we regard the conclusion as doubly secure. If a spectroscopic analysis yields the

same result as a chemical analysis, we accept the result with redoubled confidence. If a synthetical process corroborates the findings of an analytical process, our confidence that we have the true nature of the substance is confirmed beyond question. Dr. Schiller's method is purely psychological: mine is almost purely logical. The results we attain are practically identical, and we may fairly claim this identity of result as corroborative in the highest degree of the truth of our conclusions. I take the terms and propositions and arguments of Logic at their face-value, and demonstrate that, on their own showing, the positions assumed by logicians are absurd, contradictory and untenable. Dr. Schiller takes the same terms, propositions and arguments as indicative of states and processes of mind, and shows that such states and processes do not, and cannot, exist, and that the supposition that they do exist leads to absurdity and contradiction.

Dr. Schiller's main thesis, which underlies and vitalises his whole argument, is that formal logic, in the sense of a science of the form of thought apart from the matter, does not, and cannot, exist. In every argument and in every statement the matter as well as the form must be considered, and the form depends on the matter. Logic starts with a certain conventional form of proposition, and manipulates it in certain conventional ways, so as to change it into certain other conventional forms. The fact that the conventional form from which it starts is an arbitrary and ambiguous form, which in fact is capable of expressing only a minute residue of our thoughts or judgments; that the way in which logic manipulates this form is never in fact used by practical reasoners; that the forms into which the proposition is changed are grotesque and are never in practice utilised outside of books in logic—these considerations logic lightly ignores. The propositions and the arguments of logic belong to a conventional world of its own, which has nothing in common with the world of practical reality, in which men and women reason for their own and for one another's benefit. In short, logic utterly ignores and neglects the fact that every argument and every statement is undertaken for a purpose, must be adapted to that purpose, and must differ from arguments and statements serving other purposes. For aught that appears in books on logic, arguments are undertaken for no purpose except to provide conundrums that examiners may set for students to puzzle over. That the very same statement may be valid and true for one purpose and invalid and false for another purpose is a fact of which logic is utterly ignorant. "Socrates was a man" is a true and valid statement if it refers to the Socrates who appears in the dialogues of Plato. "Socrates was a man" is neither true nor valid if it refers to my defunct cat, on which I conferred the name of Socrates, or if it refers to a ship so-called. "All men are mortal, and Socrates was a man, therefore Socrates is mortal" is a valid argument if its purpose was to ascertain the mortality of the philosopher. If the purpose was to ascertain the mortality of my cat, it is an invalid argument with a true conclusion. If its purpose was to ascertain the mortality of a yacht, it is an invalid argument with a false conclusion. We can never know whether an argument is or is not valid, or whether the conclusion is or is not true unless we take into consideration the purpose of the argu-

ment. However valid it may be in point of form, it is always liable to be invalidated by a consideration of its matter. Formal logic is therefore, *per se*, useless, silly, and dangerous. Logic can never be of any service unless the matter as well as the form is an integral part of the argument.

It has been made a matter of reproach to me, and I daresay it will be made a matter of reproach to Dr. Schiller, that we go over the same ground as the old logic that we are refuting. For my part, I do not see how it is possible to refute the old logic without going point by point over the same ground. Any stick is good enough to beat a dog with, and any objection is good enough to make against those who are sacrilegious enough to attack the old logic. Dr. Schiller follows the order of the text-books, and shows that as to the intention and extension of terms, as to the categories, the predicables, as to definition and classification, in the elementary part of logic, the truth holds good throughout, that none of them is valid or is of any use without reference to their several purposes on the occasion of using them. In treating of judgment, he shows how the process of judgment is not, as logic pretends, a process of juggling with words, regardless of the purpose of the argument, but a process of selecting what is relevant to the purpose of the argument and rejecting what is irrelevant.

In his examination of the so-called laws of thought, Dr. Schiller goes far deeper than I do. I content myself by taking them at their face value, and showing that, so taken, they are not laws of thought at all, but empty and silly truisms. Dr. Schiller enumerates with great ingenuity all the various meanings that may be read into them, and shows that whatever meaning we take, it lands us at last in an absurdity. The examination of these laws by Dr. Schiller is a fine piece of analysis and dialectic, and is well worth reading on that account alone. He finally shows how the validity of all our assertions, even such elementary assertions as A is A, depends on their relevancy to our purpose, whatever that may be at the time.

Examining the logical doctrine of quantity, Dr. Schiller again shows how impossible it is to affix in practice any of the quantities which logic arbitrarily connects with propositions. "The function of a proposition," he very rightly says, "is to convey a meaning. . . . If it conveys the meaning intended, it fulfils its purpose and validates its form, whatever it may be." This is precisely the same doctrine, which I express in other words, of the necessity of taking account of the purpose of the argument. Unless the meaning or purpose of a statement is taken into account, the statement is a grammatical sentence, but it is not a logical proposition. Here Dr. Schiller leaves the examination of quantity. He does not pursue the matter, as I do, with an enumeration of all the many quantities that are in use. The treatment of negation is brief, and to my mind scarcely adequate to the importance of the subject. Dr. Schiller has no difficulty in showing the ambiguity of the A, E, I and O propositions, and how the attempt to remove the ambiguity by explicitly quantifying the predicate produces confusion worse confounded, and he agrees with me that the immediate inferences of formal logic do not represent any processes of actual thinking.

The new answer that Dr. Schiller gives to the old riddle, whether

inference is an advance from the known to the unknown—whether inference gives us anything new—is that psychologically there must be novelty, but logically there cannot be novelty. If, for instance, we infer from all men are mortal that some men are mortal, the inference must at the time it was made have been made for some purpose, and must therefore have then seemed worth making. As soon as the inference is made, it must be apparent to the reasoner that he has attained nothing new, because his conclusion was implicit in his premisses, but he could not have seen this at the time he made his inference or he would never have troubled to make it. My own explanation is that the function of inference is to state explicitly what is implicit in the premisses, and this, I think, comes to much the same as Dr. Schiller's explanation.

To the syllogism Dr. Schiller attaches an importance that seems to me exaggerated. "Of all the discoveries," he says, "which man has made by dint of sheer reflection, the syllogism is assuredly the greatest." In this I should join issue with him. The forty-seventh proposition of the first book of Euclid seems to me an incomparably greater discovery than the syllogism. Here, it seems to me, Dr. Schiller has not completely emancipated himself from what I consider the superstition that the syllogism is the general model to which all reasoning conforms. My view is that so far from this being the case, the syllogism is but a small part of a sub-rule of a minor canon of one of the lemmas to one of five canons of inference, and inference itself is but one of three distinct modes of reasoning. It is the more strange that Dr. Schiller should sign and subscribe this certificate to the value of the syllogism, since he devotes the chapter that opens with this declaration to a cruelly destructive analysis of the syllogism. The most valuable part of this analysis seems to me to be the endorsement of Mr. A. Sidgwick's discovery that the middle term of the syllogism may always be ambiguous. An ambiguous middle always vitiates a syllogism, and since the middle may always be understood in more than one sense, there is no guarantee that the syllogism can ever be valid.

The crux of traditional logic was, and is, the origin and validity of its premisses. It was on the nature of universals that the endless discussions of the schoolmen turned. Dr. Schiller shows exhaustively that there are three possible grounds for the universal. It may be founded on intuition, on generalisation, or on postulation. He has no difficulty in showing the worthlessness of intuition as a basis. A universal founded on generalisation may be founded on a complete generalisation, that is to say, one that includes every possible instance, such as Every month in the year has less than sixty days; or on an incomplete generalisation, in which some instances only have been examined, such as Every tree has roots. Dr. Schiller says that the examination of the cases can never be assumed to be either exhaustive or correct, but in this he seems to have gone too far. There are many cases in which the number of instances is small, and every instance is known, such as that already cited of the months, and such universals as Every member of Parliament sits for some constituency, Every animal confined in the Zoological Gardens is fed by man, Every house in this street has a bath-room, and so forth. In such cases the examina-



tion is both exhaustive and correct, but in such cases the syllogism is worthless on account of question-begging. When the generalisation is not exhaustive, the syllogism is worthless because it is invalid. The true origin of universals is, in Dr. Schiller's opinion, postulation, and this is the conclusion at which I had arrived independently, and on quite different grounds.

"Inductive logicians," says Dr. Schiller, "have usually been in full and conscious revolt against the tyranny of the syllogism. Nevertheless it is a curious fact that they have always succumbed to its fascination. One after the other they adopt again the ideal of formal logic, and try to represent inductive reasoning in the guise of a formally necessary type of valid inference." This is the charge that I also have brought against logicians of the inductive school. They constantly try, as I put it, to put the new wine of scientific discovery into the old syllogistic bottle; and the bottle always bursts. I think that inductive reasoning should not be called inference, but I should contend that inductive reasoning, as I understand it, does, or may, lead to conclusions that are formally necessary, if by formally necessary we mean necessarily accepted as true. Of course, all depends on what we mean by induction, and this is a matter to which Dr. Schiller gives more attention than any other logician known to me. He distinguishes four Aristotelian meanings, a Baconian meaning different from them all, and Mill's meaning, which — and here Dr. Schiller agrees with me — is merely the discovery of causation. That this is a wretchedly incomplete and inadequate concept of induction is insisted on in my logic; and Dr. Schiller shows that even in this very limited, though certainly important, sphere, Mill's canons are utterly inadequate. In order to apply them at all we must already possess so much knowledge as would render their application unnecessary. What the real method of discovering causation is, Dr. Schiller sets forth in terms which seem to me conclusively satisfactory.

A long chapter is devoted to analysis of the concept of causation, a subject that has engaged the attention of philosophers at least since Hume. Dr. Schiller's analysis is extremely acute and convincing, but in my opinion the subject is not properly within the domain of logic. It pertains to philosophy, and although no doubt it is within the province of logic to discover and explain by what process causation, supposing there is such a thing as causation, is in practice discovered, it is no more a part of logic to show what causation is than to show what co-existence or succession is.

It is interesting to find that Dr. Schiller, analysing the traditional fallacies from the psychological standpoint, arrives at the same conclusions as I do, criticising them logically. We agree that the material fallacies are, in formal logic, illogical excrescences and superfluities. They are intruders, and have no business there. Nevertheless, they certainly pertain to logic, and hence formal logic stands convicted of illogical limitation.

The general conclusions at which Dr. Schiller arrives are that formal logic has completely dehumanised itself, and is for ever divorced from every actual problem of science or life; that it is devoid of meaning; that it is an irrational pseudo-science; that it is worthless as a mental

training ; and that the best that can be said for it is that it is a good game for intellectually-minded men. In all this, except, perhaps, the last particular, I should heartily agree.

When Dr. Schiller goes on to expose the malign effects of logic on society, on mental training, on science, on religion, and on mankind generally, he seems to me to exaggerate its importance and its influence. In as far as he deals with the past, now fading into distance, much of what he says is no doubt historically true ; but at the present day, logic, as it is taught in the text-books, has scarcely any influence at all. No one studies it except at a university. No English university but that of Oxford gives it any prominence, and even at Oxford, only a minority of the students are required to study it ; and of those who do study it none but an insignificant remnant pay any attention to it, or fail to discard it altogether as unworthy of consideration, the moment their novitiate is past.

It is not uninteresting to compare two books so nearly identical in aim as Dr. Schiller's and mine, appearing simultaneously and unexpectedly without collusion or agreement on the part of the writers, or even knowledge of either that the other was engaged on a similar task. Dr. Schiller's book ferments with indignation, and what seems almost like a personal detestation of a personified logic ; mine is permeated by an amused contempt. Dr. Schiller's objections are psychological throughout ; mine are logical. Dr. Schiller is purely destructive ; he pulls down with remorseless fury, but he does not attempt to rebuild : my primary aim is constructive, and I pull down only to clear the ground for the erection of my own new fabric. Dr. Schiller goes much deeper than I do. I merely pull down the ramshackle old structure, and level it with the ground : Dr. Schiller digs up the foundations. Dr. Schiller shows that the form of formal logic is form without substance, and insists upon the emptiness of the forms : I take the forms at their face value, and show that, even granting that they have substance, they are worthless. Dr. Schiller speaks as a professional logician, having the whole of Greek philosophy at his finger-tips : I speak merely as a practical reasoner, having only a very superficial acquaintance with the Greek origin of logic, and, with respect to traditional logic, a mere outsider. It is the more remarkable that our conclusions should be in such close agreement as to be almost identical. It is the more remarkable that these, the first thoroughly destructive criticisms of the logic of tradition, should so completely harmonise with each other.

C. A. MERCIER.

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*A New Logic.* By CHARLES MERCIER, M.D., F.R.C.P., F.R.C.S.  
London : William Heinemann, 1912. Pp. 422. Price 10s.

A review of this volume will appear in the July number of the *Journal of Mental Science*.

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*A Tale of Hallucinations and Impulses.*

A short time back I received from a friend a book, which he had picked up at a bookstall for twopence. Seeing in it things that he thought might interest me, he was kind enough to forward it. I, in