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Formal Logic

Or, The Calculus of Inference, Necessary and Probable

AUGUSTUS DE MORGAN

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Καλὸς ὁ νόμος ἐάν τις αὐτῷ νομίμως χρῆται.

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PREFACE.

THE ſyſtem given in this work extends beyond that commonly received, in ſeveral directions. A brief ſtatement of what is now ſubmitted for adoption into the theory of inference will be the matter of this preface.

In the form of the propoſition, the copula is made as abſtract as the terms: or is conſidered as obeying only thoſe conditions which are neceſſary to inference.

Every name is treated in connection with its *contrary* or *contradictory* name; the diſtinction between theſe words not being made, and others ſupplied in conſequence. Eight really ſeparable forms of predication are thus obtained, between any two names: the eight of the common ſyſtem amounting only to ſix, when, as throughout my work, the two forms of a convertible propoſition are conſidered as identical.

The complex propoſition is introduced, conſiſting in the coexiſtence of two ſimple ones. The theory of the ſyllogiſm of complex propoſitions is made to precede that of the ſimple or ordinary ſyllogiſm; which laſt is deduced from it. I have only uſed the word *complex*, becauſe *ſimple* was already appropriated (ſee page 85).

By the introduction of contraries, the number of valid ſyllogiſtic forms is increaſed to thirty-two, connected together by many rules of relation, but all ſhewn to contain, each with reference to its own diſpoſition of names and contraries, only one form of inference.

The diſtinction of figure is avoided from the beginning by introducing into every propoſition an order of reference to its terms.

A ſimple notation, which includes the common one, gives the means of repreſenting every ſyllogiſm by three letters, each accented above or below. By inſpection of one of theſe ſymbols it is ſeen immediately, 1. What ſyllogiſm is repreſented, 2. Whether it be valid or invalid, 3. How it is at once to be written down, 4. What axiom the inference contains, or what is the act of the mind when it makes that inference (chapter XIV).

A ſubordinate notation is uſed (page 60) in abbreviation of the propoſition at length.

Compound names are conſidered, both when the compoſition is conjunctive, and when it is disjunctive. Diſtinct notation and rules of transformation are given, and the compound ſyllogiſms are treated as reducible to ordinary ones, by invention of compound names.

The theory of the numerical ſyllogiſm is inveſtigated, in which, upon the hypotheſis of numerical quantity in both terms of every propoſition, a numerical inference is made.

But, when the numerical relations of the ſeveral terms are fully known, all that is unuſual in the quantity of the predicate is ſhown to be either ſuperfluous, or elſe, as I have called it, ſpurious.

The old doctrine of modals is made to give place to the numerical theory of probability. Many will object to this theory as extralogical. But I cannot ſee on what definition, founded on real diſtinction, the excluſion of it can be maintained. When I am told that logic conſiders the validity of the inference, independently of the truth or falſehood of the matter, or ſupplies the conditions under which the hypothetical truth of the matter of the premiſes gives hypothetical truth to the matter of the concluſion, I ſee a real definition, which propounds for conſideration the forms and laws of inferential thought. But when it is further added that the only hypothetical truth ſhall be abſolute truth, certain knowledge, I begin to ſee arbitrary diſtinction, wanting the reality of that which preceded. Without pretending that logic can take cognizance of the probability of any given matter, I cannot underſtand why the ſtudy of the effect which partial belief of the premiſes produces with reſpect to the concluſion, ſhould be ſeparated from that of the conſequences of ſuppoſing the former to be abſolutely true. Not however to diſpute upon names, I mean that I ſhould maintain, againſt thoſe who would exclude the theory of probability from logic, that, call it by what name they like, it ſhould accompany logic as a ſtudy.

I have, of courſe, been obliged to expreſs, in my own manner, my own convictions on points of mental philoſophy. But any one will ſee that, in all which I have propoſed for adoption, it matters nothing whether my views of the phenomena of thought, or others, be made the baſis of the explanation. So far therefore, as I am

conſidered as propoſing forms of ſyllogiſm, &c. to the logician, and not giving inſtruction to the ſtudent of the ſcience, the reader has nothing to do with my choice of the terms in which mental operations are ſpoken of.

In the appendix will be found ſome remarks on the perſonal controverſy between Sir W. Hamilton of Edinburgh and myſelf, of which I ſuppoſe the celebrity of my opponent, and the appearance of part of it in a journal ſo widely circulated as the *Athenæum*, has cauſed many ſtudents of logic to hear or read ſomething.

At the end of the contents of ſome chapters in the following table, are a few additions and corrections, to which I requeſt the reader's attention.

A. De Morgan.

Univerſity College, London,
October 14, 1847.

TABLE OF CONTENTS.

*** The articles entered in *Italic*, are thoſe, the contents of which belong to the peculiar ſyſtem preſented in this work.

Additions and corrections.—Page 79, in the firſt diagram, for D_1D_1D, read $D_1D_1D_1$; *page* 88, *line* 23, *inſtead of* has the other two for its opponents, *read* has its opponents in the ſet; *page* 90, *line* 4, *from the bottom, for* premiſs *read* premiſe: the firſt ſpelling has been common enough, but it ſeems ſtrange that the cognate words promiſe, ſurmiſe, demiſe, &c. ſhould not have dictated the ſecond. *Page* 96;