

## PREFACE

Logic is only now emerging from a renaissance such as was undergone by physics centuries ago. Pinpointed, the logical renaissance might be identified with the publication of Frege's *Begriffsschrift* in 1879—a book which is no older today than was Copernicus' *De revolutionibus* in the heyday of Galileo. Insufficiently removed to command a proper perspective, we tend to overlook the continuities and to exaggerate the disparities between the old logic and the new. There is an air even of partisan sentiment, as if a revolution were at stake.

Logical issues have been beclouded, and sentiment aggravated, by a popular notion that the old logic and the new are at philosophical odds and that a commitment to logical positivism is integral to modern logic. One is led to imagine multiple norms of logical validity, with philosophy as arbiter; a curious inversion.

Actually the logic of tradition and the logic of current researches are in an important way one: our basic sense of validity has not changed. In logic today we have, indeed, a clearer picture of essential relationships, a higher standard of rigor, and a more powerful set of techniques. But the logical inferences which this fuller knowledge enables us to draw are inferences in which our forebears in logic would certainly concur, with a conviction equal to our own, once our techniques of analysis were explained to them. To this generalization no exception need be made on the score even of the more tenuous and conjectural portions of higher set theory; a reanimated ancient might indeed feel misgivings in this domain even after we had brought him up to date on all the relevant considerations, but I doubt that his misgivings would differ from our own.

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Insofar as logical reasoning is efficacious in philosophy, it is a credit to the positivists' judgment and even some presumption in favor of their philosophy that they have exploited logic in its most highly developed available form. But it is a factual error to suppose that the positivists and their kin have had a monopoly on modern logic. It is also a factual error to suppose that the positivists have grounded their philosophical tenets on pure logic, new or old, unadulterated with philosophical speculation; and it is a logical error to suppose that there are any peculiarly positivistic assumptions, or empiricistic presuppositions of any sort, in modern logic itself. Finally it is certainly a tactical and methodological error to forego the benefits of modern logic in defending or exploring any philosophy. Tactically it is the folly of shunning the opponent's advantage; methodologically it is the folly of neglecting an avenue to truth.

The exaggerated notion of the cleavage between the old and the new logic fosters the very ignorance which engenders it. Scholars engrossed in the logical tradition tend to be unaware of the degree to which the old results with which they are familiar have come to be integrated into the modern science of logic; unaware of the supplementary clarifications and extensions which those old results have undergone in recent times; unaware of the opportunity, denied to Aquinas and Peter of Spain, of garnering the fruits of later labor. Scientists engrossed in current logical research tend conversely to be unaware of the antiquity of much of their science; unaware for example that their myopic phrase "De Morgan's Laws" refers to principles enunciated by William of Ockham and Peter of Spain. They tend indeed to place the beginning of modern logic in 1854 or earlier, rather than 1879, unaware of how much community there is in spirit and in substantive theory between Boole and

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De Morgan in the mid-nineteenth century and their mediæval and ancient predecessors. On various peripheral issues of a discursive kind, moreover, having to do with semantics or with modal logic, logicians pursue their current excogitations and disputations unaware of the degree to which they are reenacting recorded history.

But if it is deplorable to exaggerate the cleavage between the old and the new logic, it would be yet more deplorable to underestimate the novelty and importance of the new. 1879 did indeed usher in a renaissance, bringing quantification theory and therewith the most powerful and most characteristic instrument of modern logic. Logical and semantical problems with which Aquinas and others had grappled admit of simpler and clearer treatment in the light of quantification theory; and with the aid of quantification theory modern logicians have been able to illuminate the mechanism of deduction in general, and the foundations of mathematics in particular, to a degree hitherto undreamed of.

It behooves scholars interested in any phase of logic to acquaint themselves with the fully scientific stage of their subject; and it behooves the elaborators of this growing structure to acquaint themselves with the long tradition whose hither end they are helping to fashion. Both desiderata are brought nearer by the ensuing doubly sympathetic account, prepared by an appreciative student both of modern logic and of the long tradition. By his apt translations of ancient and mediæval passages into the technical terminology of current logic, Father Clark brings our remote predecessors so convincingly up to date that we feel we have been listening to them—Chrysippus, Aquinas, Peter of Spain, and the rest—in a Harvard logic seminar.

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