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TENDENCIES IN THE LOGIC OF MATHEMATICS¹

By Professor E. R. HEDRICK

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1. INTRODUCTION

I APPROACH this subject which I have announced for to-day, "Tendencies in the Logic of Mathematics," with some trepidation, with many misgivings, and, I trust, with due humility. To many, the logic of mathematics is old, fixed, immutable. To shake faith in it, even to express a doubt concerning it, is to these nothing short of heresy. As Professor C. I. Lewis, of Harvard University, says in the October issue of *The Monist*: "From Aristotle down, the laws of logic have been regarded as fixed and archetypal; and as such that they admit of no conceivable alternatives. Often they have been attributed to the structure of the Universe or to the nature of human reason; and in general they have been regarded as providing

¹ Address of the retiring chairman and vice-president of Section A—Mathematics, American Association for the Advancement of Science, Atlantic City, December 28, 1932.

Yet long ago, as I shall indicate, doubts appeared; and within my own lifetime definite and undeniable difficulties have arisen which leave no room for a complacent acceptance of the logic of the ancients in unchanged form. I shall attempt to-day to state some of the difficulties and some of the proposed remedies. We shall see that there is to-day, if not universal agreement on the details of new systems, at least essential agreement that fundamental changes are necessary. As Lewis remarks in the article quoted: "There are no laws of logic which can be attributed to the universe or to human reason in the traditional form." Acceptance of such doctrine, however, like acceptance of other revolutionary changes in the history of human thought, of which the most recent is the theory of relativity, comes slowly; always men's minds revert to older ways of thought, always the interpretations placed upon the newer statements may be mistaken, always there is need for slow and detailed statement

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