

## THE ALLEGED ABSURDITY OF ALGEBRA

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IN the September number of BLACKFRIARS\* Father McNabb has attempted to trace the influence of Cartesian Doubt in the development of modern algebra. Now just as philosophy must not be identified with the fallacies of philosophers, so mathematics must not be identified with the mistakes of mathematicians, nor algebra with the absurdities of algebraists. To make such an identification betokens lack of knowledge of the subject under discussion. It is this nescience of modern algebra which vitiates the strictures passed by Father McNabb.

There are treatises on algebra which give a most unsatisfactory account of complex numbers, just as there are treatises on the Eucharist which give an unsatisfactory account of its sacrificial nature. But neither algebra nor theology is invalidated by the inadequacy of its exposition.

The article by Father McNabb affords an illustration of the lamentable lack of understanding between philosophers and mathematicians. A mathematician taking up the study of philosophy labours under the well-known disabilities due to the difference in the nature of proof demanded in each discipline. A philosopher taking up the study of mathematics is bewildered by the many meanings which the same mathematical term may possess in different branches of study. Thus the word 'number' may mean a signless integer, a positive or negative integer, a fraction, an irrational number, a complex number, a matrix, an operation. All these are distinct species of number and a mathematician, writing for mathematicians,

\* *The Father of Modern Doubt, A Study of Descartes.*—BLACKFRIARS, 1929, pp. 1291—6.

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often fails to state explicitly to which species he refers. Thus the statement that there exists no number whose square is equal to  $-1$  requires to be elucidated by a definition of the word 'number.' The statement remains true for the first four species of number mentioned above, but is false for the last three species.

The clear distinction in modern algebra between real and complex numbers owes much to the geometrical representation of complex numbers by Cartesian co-ordinates. In fact, it is probable that it was the introduction of Cartesian methods by Argana which enabled the axioms of complex algebra to be formulated without absurdity.

It need scarcely be noted that the 'imaginary' and 'irrational' in algebra are merely the lively names given to certain species of number. They must not be taken literally any more than the psychological terms 'apprehension' or 'abstraction.'

Finally it must be added, in view of Father McNabb's reference to 'the fallacy of  $\pi$ ,' that the clear recognition that a curve cannot be fitly expressed as a straight line is the very foundation of the integral calculus, with its precise definitions of those numbers which are termed by analogy the 'length' and 'area' of a curve.

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