

can only be overcome by the employment of special devices later. When setting up Lagrange's equations, the virtual displacement will be chosen to be consistent with the constraints, but more general displacements are often convenient for the solution of statical problems and there seems no reason to exclude them from the start.

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To the Editor of the *Mathematical Gazette*

DEAR SIR,—I have read Professor Sondheimer's inaugural lecture with great interest, nevertheless I remain unconvinced that applied mathematics is a science.

I find it easy to agree that "pure mathematics is essentially pure logic"; I find it much more difficult to accept the suggestion that "applied mathematics uses mathematical methods to study and describe and formulate theories of observable phenomena in the external world". If one can accept this definition then it is reasonable to conclude that applied mathematics can be physics. But surely this is true only during the process of research and development. As Professor Sondheimer explains, "Once a branch of the subject has been fully established, we do try to bring out its logical coherence in just this way, by developing it like a branch of pure mathematics from a fundamental set of axioms which are chosen so as to summarise some particular aspect of our experience of the external world."

By the time an applied mathematics has been incorporated in the text-books it will be more or less indistinguishable from pure mathematics. The student of this subject will not necessarily be concerned with the relevance of the axioms to the external world, and in many cases will not know enough of physics to judge their relevance for himself. Also the applied mathematics of one generation may become the pure mathematics of another, when its axioms are shown to be no longer consistent with physical theory.

Perhaps the most satisfactory conclusion is that applied mathematics can be regarded either as mathematics or science. For the research worker it can be a science: for many students it is simply mathematics, but it should be possible for teachers to make use of both aspects of the subject in their teaching.

Professor Sondheimer's definition of applied mathematics raises another important question. Physics is not the only science which uses mathematical methods to formulate theories concerning the external world. Should these other sciences be used as the basis for other applied mathematics? Should there be, for example, an applied mathematics to correspond to Mathematical Economics?

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