subsequent stage is any attempt made to interpret this. In a vectorial treatment of mechanics which precludes a course on tensor analysis one tends to think of velocities and accelerations as being vectorial. However the solution provided shows that $dv'/dt$ does not transform in the manner of a first-order tensor. A pity that the opportunity of discussing this feature was not taken up at some stage.

The book is well-referenced.

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The subject of modelling has been around for many years without being specifically mentioned. Perhaps one could say that the most famous example was the enunciation by Newton of the Laws of Motion. However, over the past twenty years or so, there has been a more explicit recognition of modelling processes and many books have been written about the ideas involved. The present book is based on work by the two authors in the Warsaw University of Technology and is interesting in that it gives a fresh viewpoint on the fundamental ideas.

There are five chapters. The first is entitled 'basic notions of modelling'. In this the authors discuss the difference between physical and mathematical modelling and point out the influence of the purpose of an investigation upon its form. There is an interesting analysis of the motion of a compound pendulum and the authors note that not every system can be represented by a differential equation. The second chapter considers the framework for modelling. It discusses the fundamental ideas of classical mechanics, and introduces the ideas of generalised coordinates, constraints and the use of quasi-coordinates. Other topics discussed are the ideas underlying the use of Eulerian and Lagrangian coordinates and the use of state space. In the third chapter, on modelling by means of balance laws, the authors provide a general basis for the modelling of mechanical processes. This is in effect a summary of the laws governing particle and rigid body mechanics. The authors illustrate these by examples which come from their work in aeronautics, the fall of a parachute, the elevator hydraulic amplifier, and re-entry of a vehicle from space.

The fourth chapter, on modelling using variational principles, discusses the ideas of variational principles in mechanics. This contains a number of topics such as Lagrange's equations, which might be expected. However, there are topics which do not normally appear in text books on mechanics, namely the Boltzmann-Hamel equations and the Maggi equations for nonholonomic systems. (Unfortunately no reference is given for further reading on these latter equations.) Again the examples discussed are interesting and unusual – for example the non-ringing of the Kaiserglocke of Cologne Cathedral, longitudinal motion of an aircraft and a constant speed mechanism. The fifth chapter deals with modelling by means of graphs. This begins with a short introduction to and a brief history of graph theory. The authors then introduce the ideas of through-variables and across-variables and show how mechanical (and indeed electrical and fluid) variables may be discussed in this way. From this they show how matrix representations of systems may be obtained and illustrate these ideas with a model of a four-link robot. The book closes with a postscript which indicates the pitfalls which a prospective modeller must avoid, and there is a list of references dating back to a paper by Euler from 1736!

This is a very interesting book. There are some portions of the book – for example the treatment of the compound pendulum – which would be within the scope of an intelligent sixth former, and on the whole the treatment of various topics might be
described as sophisticated rather than advanced. (I found the idea of using graph theory for the solution of mechanical problems of great interest.) The translation reads well and the presentation is attractive, with very few printing errors. A companion volume on continuous models is to follow. This book can be recommended to applied mathematicians, physicists and engineers. It is a great pity though that the price will put it out of reach of most individuals and indeed of many libraries.

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This is an account of a symposium held by the Australian Engineering Mathematics Group on June 16, 1992. It contains a number of papers of varying mathematical content describing various engineering problems which have been amenable to mathematical treatment. Examples of the fields mentioned are the flow of a landslide, the vibration of propshafts of cars, telecommunications and the dissipation of smoke fumes from chimneys. Two subjects which receive somewhat more substantial treatment are Oil Production and Injection Moulding.

Bearing in mind that there is an ever increasing tendency for Engineering Departments in the United Kingdom to take over the teaching of mathematics to their students, there is a timely discussion of the lowering of standards which can occur when this happens.

The book will be of general interest to those teaching Engineering Mathematics. It shows the vast field of real problems where mathematics plays an important role.

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This book consists of nine expository papers on a variety of subjects which would have been presented at a symposium in Indonesia in 1992 which never took place.

The titles of the papers are as follows:

1. A kaleidoscopic excursion into numerical calculations of differential equations
2. An introduction to the Finite Element Method
3. Coupling of sound and structural vibrations
4. Mathematical modelling and dimensional analysis
5. About difference equations, algebras and discrete events
6. Acoustical detection of obstructions in a pipe with a temperature gradient
7. Interior point approach to linear programming: theory, algorithms and parametric analysis
8. Some reflections on Newton's method

The quality of the papers is variable, but there are one or two interesting items. For example, in (3) there is a short discussion on how ship vibration may be reduced and in (4) there is a proof of Pythagoras' Theorem, and a discussion on how wheel steering works. On the whole however the contents are theoretical in nature and discuss methods rather than problems, and many engineers will not be in possession of the necessary mathematical knowledge for an understanding of (8) which involves concepts such as