Fringe visibility in two-beam systems occupies the fifth chapter. In the following chapter Michelson's interferometer is treated comprehensively, and here I welcome the introduction of this interference system as used for microwaves as well as for light waves. The seventh chapter, which deals with multiple-beam interference systems, is right up to date with regard to refinements of theory, new instrumentation and bibliography. Yet, curiously enough, the author, like so many others expert in interferometry, fails to refer to Boulouch, the real inventor of the multiple-beam fringe sharpening principle, indeed creating in effect what we now call both Fabry–Perot and Lummer plate interferometers. This historical detail deserves rectification if a second edition be called for.

As might of course be expected from a writer who works at a National Standards Laboratory, the section on interference comparators, the measurement of length and the interferometric assessment of refractive indices is very good. Here, too, I welcome brief, clear descriptions of microwave analogues to optical interferometers. The ninth chapter covers a great deal of ground, including the use of multiple-beam interference methods for the study of surface microtopography, the testing of optical surfaces, shear interferometers and also the rapidly growing new field of interference microscopes. This latter section might with advantage have been expanded somewhat, now that transmission interference microscopes of a variety of types are coming on to the market for use by biologists, who more and more are beginning to appreciate what interferometry can offer them.

Although the tenth chapter, which deals with interference spectroscopy, is certainly up to date and includes many recent refinements in instrumentation, it is rather lame with respect to the actual optical requirements involved in practice when combining an interferometer with a spectrograph. This involves numerous pitfalls, and the student hoping to become a high resolution spectroscopist is not going to find any real "know-how" here to help him. No tricks for adjusting interferometers, no warnings about possible varieties of ghost or reflected images, no hint at all about how to make the essential high reflecting films and so on. For this the student would have to look elsewhere. Indeed, because of the gloss over such details, interference spectroscopy is made to sound a good deal easier than in practice it is. Nevertheless there is sufficient of very real value in this book for every student of optics and spectroscopy, and the final chapter, entitled "Interference Imagery", contains a valuable and clear discussion of stellar interferometers, both of the optical and radio types.

Altogether this is a most readable text and, although the introductory part makes it heavy weather for the undergraduate, it is to be well recommended to any student who wishes to specialize in optics, metrology or spectroscopy. The book is particularly well illustrated with line diagrams, but regretfully has no plates at all—a pity, because interferograms are often photogenic. The comprehensive fourteen-page bibliography with well over five hundred references will be of real value to the student who wishes to go further.

I welcome this new text.   S. TOLANSKY

DIFFERENTIAL EQUATIONS

Introduction to Ordinary Differential Equations
By Albert L. Rabenstein. (Academic Press Textbooks in Mathematics.) Pp. xii + 431. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.) 80s.

THIS book represents a well organized introduction to what used, in textbooks, to be a somewhat disorganized subject. In the main, apart from the basic existence

theorem for solutions of ordinary differential equations, all the results are proved.

There is a discussion of the various cases of Frobenius's method of solution in series and a considerable treatment of results concerning sets of orthogonal polynomials, both general sets and particular sets. Sturm–Liouville theory is discussed in one chapter with a brief mention of some singular cases, but it is odd to note that the two originators of the theory are not mentioned at all.

Other topics included are systems of differential equations, Laplace transforms, separation of variables, and autonomous systems, and there is a short excursus into the theory of partial differential equations.

There are sufficient exercises together with answers to about half of them to provide an eminently readable textbook for a second or third year undergraduate mathematics or engineering student.   R. L. PERRY

MORE DIFFERENTIAL EQUATIONS

Elementary Partial Differential Equations
By Paul W. Berg and James L. McGregor. (Holden-Day Series in Mathematics.) Pp. xv + 421. (San Francisco, London and Amsterdam: Holden-Day, Inc., 1966.) $13.

THIS book is formed by a revised collection of notes of lectures given at Stanford University, and is suitable for mathematics students or mathematically inclined physicists and engineers.

It is based on the concept of separation of variables which is adapted to cater for various boundary conditions and various initial conditions. There are several introductory chapters containing concepts and theory needed later, covering among other topics Fourier series and some ordinary differential equation theory including Sturm–Liouville theory. The theory is mostly in respect of the heat, wave and Laplace equations in two or three dimensions and seems somewhat repetitive, but the methods and theorems can apply to similar equations. Extensions to semi-infinite and infinite intervals are also included. Each chapter contains exercises and some but not all answers are supplied.

The authors have produced a book which covers those aspects of partial differential equation theory which are perhaps those of most interest to the physicist and engineer.   R. L. PERRY

CENTRES OF IMMUNITY

Germinal Centres in Immune Responses
Edited by H. Cottier, N. Odartchenko, R. Schindler and C. C. Congdon. (Proceedings of a Symposium held at the University of Berne, Switzerland, June 22–24, 1966.) Pp. xvi + 499. (Berlin and New York: Springer-Verlag, 1967.) 78 D.M.; $19.50.

THIS book contains fifty-seven contributions on various aspects of the role of germinal centres in immunity. In addition, a considerable amount of space has been devoted to the discussions which followed each session, and a valuable concluding summary of the whole proceedings is also provided. The name "germinal centre" was coined more than 80 years ago, to describe the prominent clusters of pale staining cells found in lymphoid tissues. These centres show intense proliferative activity, and so they have been thought to be sites of small lymphocyte production. Although this assumption is no longer wholly tenable, there is a growing body of evidence that they play an important part in certain immune responses.

One of the aims of the book, as stated in the preface, is to combine this evidence "in a single package". It succeeds in being comprehensive, but this is at the expense of repeating data which have been published in the proceed.