were the volumes on the Simuliidae, Hippoboscidae, and Phlebotominae in Lindner's *Die Fliegen der Palaearktischen Region.*

For those not familiar with the earlier editions of this work, I will summarize its contents briefly. It is primarily devoted to descriptions, keys, and excellent illustrations that are intended to aid in identifying the insects of medical importance in the Old World. There is also considerable information on the relation of arthropods to disease transmission. An introductory chapter on insect structure, ontogeny, biology, taxonomy, and zoogeography precedes five chapters devoted to Diptera, four chapters devoted to other insects and arthropods, and an appendix on collecting and preserving techniques. The volume is still very useful, although the rather sketchy character of the addenda is a bit disappointing.

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## Mathematics

**A First Course in Partial Differential Equations: With Complex Variables and Transform Methods** [Blaisdell (Ginn), New York, 1965. 458 pp., $12.50], by H. F. Weinberger, is designed as a text for a 1-year course in partial differential equations at the undergraduate or first year graduate level. The differential equations are emphasized from the beginning; the tools for their solution are brought in as needed. General properties of the solutions, such as maximum principles, properly posed problems, characteristics, and domains of dependence, are clearly stated. There are also sections on general orthogonal expansions and on the Sturm-Liouville theory for ordinary second-order equations. Green's functions are introduced in connection with both ordinary and partial differential equations. The book is more than a collection of methods for solving equations, although the standard methods of solution are presented.

By way of preparation, the student should have had a course in advanced calculus and should be familiar with the elementary theory of limits, differentiation (including partial differentiation), and integration, with vector field theory including the divergence theorem, with the theorems on the uniform convergence of sequences and series, with improper integrals, and with the elementary properties and methods of solution of ordinary linear differential equations, mainly those with constant coefficients.

The author begins with a careful derivation of the equations of motion of a vibrating string. The linearization of the resulting equations yields the one-dimensional wave equation which is treated in some detail in the remainder of the chapter, using the customary solution in closed form.

In chapter 2, linear operators are defined and the principle of superposition is shown to hold for such operators. Linear differential equations of the second order are classified as elliptic, parabolic, or hyperbolic.

The maximum principle is established for certain elliptic equations, and uniqueness theorems are proved for elliptic and parabolic equations in chapter 3.

The method of separation of variables is introduced in chapter 4 and leads naturally to a discussion of general orthogonal expansions which are later specialized to trigonometric series. The Riemann-Lebesgue lemma for the general expansions is used to obtain simple proofs of the pointwise and uniform convergence theorems. Series solutions are obtained for many problems.

Chapter 5, which deals with nonhomogeneous problems, begins with a study of second order ordinary differential equations in which Green's functions are introduced to handle the nonhomogeneous term. The Green's function method is carried over to certain partial differential equations along with series solution methods.

Multiple Fourier and other series are used to treat certain problems in higher dimensions in chapter 6.

Chapter 7 begins by developing the Sturm-Liouville theory for second order ordinary differential equations. Special orthogonal sets of functions, such as Bessel functions, Legendre functions, and spherical harmonics are introduced and used to solve additional boundary value problems.

The standard elementary theory of functions of a complex variable is presented in chapter 8, and the general theory is applied to the evaluation of definite integrals in chapter 9.

Brief but fairly inclusive theories of the Fourier and Laplace transforms, including inversion theorems and theorems concerning convolutions, are presented in chapters 10 and 11. A few applications are given to boundary value problems.

The book concludes with a discussion of numerical methods including finite difference methods, iteration methods, and the Ritz method. The question of stability is discussed in connection with the finite difference methods.

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## Traité de Zoologie

These two fascicules, part 2, Némathelminthes (Nématodes) and part 3, Némathelminthes (Nématodes, Gordiacés, Rotifères, Gastrotriches, Kinorhynques) (Masson, Paris, 1965. 1497 pp. Set, paper, F. 320; cloth, F. 344), the second and third parts of volume 4 of the **Traité de Zoologie**, edited by Pierre-P. Grassé, are paged consecutively, and of the 1497 pages, 1200 are devoted to the nematodes. The authors involved are L. de Coninck, A. G. Chabaud, M. Ritter, J. Théodoridès, and V. Nigon. The first 586 pages concern the anatomy, reproductive biology (157 pp., by Nigon), natural history, and parasitism of nematodes. The systematics of nematodes occupies pages 586 to 1200. The Nematoda are considered a class, and two subclasses are recognized: Adenophorea ( = Aphasmidia), and Secernentea ( = Phasmidia *auct.*). The treatment is thorough, reasonably up-to-date (with the exception of some recent electron microscope studies), and will be invaluable to all who work with nematodes, although many zoologists will feel that there is much more here than they need to know about nematodes. This elaborate and detailed treatment is in sharp contrast to the remaining groups of Nemathelminthes (= Aschelminthes) treated in the concluding part of the last fascicule. There is a short treatment of Gordiaceans by A. Dorier, a 150-page chapter on Rotifers, and somewhat perfunctory chapters on Gastrotrichs and Kinorhynchs by Paul de Beauchamp. It is unfortunate that this treatment of lesser groups is in such contrast to the exhaustive treatment of nematodes; certainly the Rotifers should be given more thorough consideration.

The pretty colored diagrams that