amniotic fluid and the analogy between plants and animals. Malpighi's ideas are examined in detail and then compared to those of other students. Again, texts are quoted in profusion and the reader is treated to a detailed historical study which moves backward and forward in time from Malpighi. Von Baer and Haller, Aristotle, and Fabricius, together with numerous other well-known and little-known figures in the history of embryology, make their appearance in these studies.

The tabulation of "literature cited" covers 80 double-columned pages, with original sources and monographic studies both included. This excellent bibliography is clearly the backbone of this work. No reader has any excuse for being lost in the embryological literature any more. Although the index of 140 pages is well constructed, the reader is put to some inconvenience because the index does not give volume numbers, the pagination through the five volumes being continuous.

Students of the history of biology and colleagues of Adelmann have known for some years that he was hard at work upon a study of Marcello Malpighi. Few would have guessed the size and scope of the finished product. One might complain that the high price of the work will keep it out of the hands of some of those who might most enjoy it, but no one can deny that through his prodigious labors Adelmann has put all those with an interest in the history of biology in his debt.

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Superconductors

The past decade has been one of exciting developments in the field of superconductivity. Foremost has been the emergence of a useful microscopic theory which has provided a quantitative interpretation of many of the principal superconducting phenomena. Significant experimental discoveries have included flux quantization, type II superconducting behavior, and a rich variety of tunneling effects. An important technological advance has occurred through the application of type II superconductors in the construction of loss-free, high-field electromagnets. It is hardly surprising that these developments have rendered somewhat obsolete the monographs on superconductivity published some 15 years ago by Shoenberg and by London. There is now a pressing need for some up-to-date treatises encompassing recent advances in the field.

P. G. de Gennes's **Superconductivity of Metals and Alloys** (P. A. Pincus, Transl. Benjamin, New York, 1966. 288 pp., illus. $12.50) is responsive to this need. The book focuses attention upon two general areas in which great progress has occurred recently, the microscopic theory of the phase transition and the origin of the two magnetically different classes of superconductor now labeled type I and type II. Although a full treatment of these topics would hardly be possible without the use of the advanced formalisms of modern solid state theory, de Gennes appears to have made an effort to utilize these techniques sparingly and to maintain a viewpoint which is on the whole more physical than mathematical. For this experimentalists will be grateful.

The first three chapters treat some of the basic characteristics of superconductors. The starting point is a rather brief discussion of thermodynamic and electrodynamic properties, made plausible in terms of an assumed condensation of the electron gas. Type I and type II magnetic phenomena are then dealt with in separate and more detailed chapters, including penetration depth and intermediate state effects in the former case and vortex structure, pinning of fluxoids, and flux creep phenomena in the latter. In chapters 4 and 5 the assumed electron condensation is analyzed from a microscopic viewpoint, following the Bardeen-Cooper-Schrieffer and Bogolubov methods. This includes a discussion of gauge invariance, flux quantization, and the origin of the Meissner effect. Chapters 6 and 7 introduce the Landau-Ginsburg equations and their application to bulk material, thin films, and various types of superconducting junctions. The book concludes with a brief discussion of magnetic impurities and gapless superconductivity. Despite a substantial number of misprints and algebraic errors in the text, *Superconductivity in Metals and Alloys* can be recommended as a useful and perhaps even essential addition to the library of the advanced student of superconductivity.

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Matrices

Charles C. Cullen inaugurates his disquisition **Matrices and Linear Transformations** (Addison-Wesley, Reading, Mass., 1966. 237 pp., illus. $8.95) by considering matrices *qua* matrices, as opposed to matrices as representations of linear transformations over a finite dimensional vector space with a preferred basis. In view of the very modest prerequisites assumed for the student, and the author's expressed desire to cover fairly rapidly topics most frequently met in engineering and physics, this seems sensible. Mathematical pedagogy being an experimental science, only classroom testing will show whether this approach is sound.

There is nothing in the book that cannot be found in one or another text, but I recall no other text written for so general a group of students that contains precisely this material and follows this mode of presentation. Linear spaces and linear transformations are treated and used, as are determinants, and the classical canonical forms of a matrix are obtained. Less usual is the inclusion of a chapter on functions of matrices and another on solutions of the equation $AX = XB$, involving iteration. More than common emphasis is placed on actual computation, interpolation, characteristic values and vectors, and, generally, devices of interest in applications. Nevertheless, the book may be regarded as "pure" in the sense that specific subjects of a physical nature are not presented in that language.

I take only the position that the text is worth trying, but is unlikely to be entirely successful for students with the very small number of prerequisites suggested by the author.

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Inclusions in Minerals

Because Soviet geologists have placed unparalleled emphasis on research on solid, liquid, and gaseous inclusions in minerals, the appearance of a book summarizing their results is important to scientists interested in natural mineral-forming processes. **Research on the Nature of Mineral-Forming Solutions** (Pergamon, New York, 1965. 747 pp. illus. $25) is a translation by V. P. Sokoloff, edited by Edwin Roedder, of three Russian publications. The first