ganisms express concern lest, between molecular biology beneath and populational biology above, the organism itself may have faded away, presumably like the Cheshire cat. It will surprise few, and I suspect that it really didn't surprise the authors, that they discovered that organisms are still with us. If there was any "shot-gun" marriage here, as the authors suggest might have been the case, it was not to hold together the organism. However, the utility of treating complex, multicellular plants and complex, multicellular animals in the same or at least alternate breaths is open to question. Although as an undergraduate I was brought up in an old-fashioned department of biology, I have come increasingly to wonder if the unity that undoubtedly exists on the biochemical and cellular levels actually exists to anything like the same meaningful extent when the higher plants and animals are reached. After all, did not a brilliant experimental physicist, Robert Wood, once explain to all of us that it is easy to tell cows from cowslips, parrots from carrots, and even beets from beetles?

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## Mathematics for Teachers

**A Vector Space Approach to Geometry**. Melvin Hausner. Prentice-Hall, Englewood Cliffs, N.J., 1965. xii + 397 pp. Illus. $12.

This text was developed for use in a 1-year, in-service course for teachers of high-school mathematics, but it is not confined to the topics taught in such courses or to those closely related thereto. The central topic is geometry, but there is little preoccupation with what the high-school course is or ought to be. Instead the book shows how geometry actually figures in contemporary mathematics. The simplicity and generality of vector space methods underlie the whole development and make the content mathematically attractive. Actually what is presented is a fusion of geometry and (linear) algebra, and numerous applications of this composite discipline to other subjects are given—for example, applications to probability, physics, and function spaces. The chapter titles are "The center of mass," "Vector algebra," "Vector spaces and subspaces," "Length and angle," "Miscellaneous applications," "Area and volume," "Further generalizations," "Matrices and linear transformations," "Area and metric considerations," "The algebra of matrices," and "Groups."

The exposition is commendable from the pedagogical standpoint also. The reader's "knowledge" is invoked to lead him painlessly to "facts" which then become formalized as axioms. The axioms are then used to derive consequences that are not just antiseptic versions of the previous material but substantial extensions of it. The area and volume treatment, in terms of outer products, is especially successful. Not so successful is the treatment of angles. Cosines are obtained from inner products, and angles are defined as what these cosines are the cosines of. In the section on rotations, these objects, properly, turn out to have a much richer structure than their noncommittal definition seems to warrant. Mathematical honesty in the treatment of angles, angle measures, and trigonometric functions is notoriously lacking in our undergraduate curriculum, and this could have been an appropriate place to supply some.

Another of my reservations is concerned with the emphasis on barycentric coordinates, at the expense of the more commonplace yet perfectly adequate affine coordinates. However, their introduction and exploitation is the most original part of the entire book, and it is probably better that they be oversold, as they are here, rather than not presented at all, which is their usual fate.

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## The Sea

**La Vie dans les Mers** (Presses Universitaires de France, Paris, 1965; 128 pp.), by Jean-Marie Pérès, replaces René Legendre's book by the same title in the series "Que Sais-Je?" Of course the subject is the same, but the book is completely different from its predecessor. Pérès is an enthusiastic ecologist, and his treatment of the subject is therefore much more ecological than that in the earlier version. Pérès is also on the side of the angels in cautioning the reader against the notion of inexhaustible resources from the sea. The French have a way of presenting science in a lucid and concise manner, but Pérès has outdone his distinguished predecessor. The French is beautifully simple and should encourage candidates who are studying for their language examination.

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## New Books

### Mathematics, Physical Sciences, and Engineering

**Acoustic Coagulation and Precipitation of Aerosols**. Evgenii Pavlovich Mednikov. Translated from the Russian edition (Moscow, 1963) by Charles V. Larrick. Consultants Bureau, New York, 1965. 188 pp. Illus. Paper, $25.

**Advances in Electronic Circuit Packaging**. vol. 5. Proceedings, 5th International Electronic Circuit Packaging Symposium. Sponsored by the University of Colorado, Electrical Design News, and Design News (Boulder, Colo.), August 1964. Lawrence L. Rosine, Ed. Plenum Press, New York, 1965. 303 pp. Illus. $15. Twenty-six papers.

**Advances in Heterocyclic Chemistry**. vol. 4. A. R. Katritzky, A. J. Boulton, and J. M. Lagowski. Academic Press, New York, 1965. 478 pp. Illus. $15. Six papers: "Covalent hydration in nitrogen-containing heteroaromatic compounds: [pt. 1] Qualitative aspects" by Adrien Albert and W. L. F. Armarego and [pt. 2] "Quantitative aspects" by D. D. Perrin; "Recent advances in oxazolone chemistry" by Robert Filler; "Isotriazoles" by R. Slack and K. R. H. Wooldridge; "Hetarynes" by H. J. den Hertog and H. C. van der Plas; and "Reactivity of azine, benzoazine, and azinoazine derivatives with simple nucleophiles" by Robert G. Shepherd and James L. Fedrick.

**The Application of Wave Mechanical Methods to the Study of Molecular Properties**. R. Daudel, Ed. Interscience (Wiley), New York, 1965. 198 pp. Illus. $9.25. Advances in Chemical Physics Series, vol. 8, edited by I. Prigogine. Ten papers presented at the International Summer Institute (Menton, France), July 1963.

**Applied Geochronology**. E. I. Hamilton. Academic Press, New York, 1965. 283 pp. Illus. $10.

**Applied Optics and Optical Engineering**. vol. 2, *The Detection of Light and Infrared Radiation*. Rudolf Kingslake, Ed. Academic Press, New York, 1965. 406 pp. Illus. $15. Nine papers contributed by Glenn A. Fry, Leslie P. Dudley, Fred H. Perrin, E. W. H. Selwyn, Rudolf Kingslake, Benjamin H. Vine, Charles H. Evans, Henry Levinstein, and Charles F. Gramm.

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