some numerical models are rather clumsy substitutes for the poorly understood rheological behavior of the plates. Until we have reached a better understanding of plate-boundary processes and are able to incorporate them self-consistently into global circulation models, the theory of mantle convection cannot be considered complete.

In order to illustrate where we stand, the emergence of plate tectonics has often been compared with the various steps of the scientific revolution in the sixteenth and seventeenth centuries. Wegener wrote in regard to the driving force that ''the Newton of drift theory has not yet appeared... .'' While he himself could be compared with Copernicus, the age of Kepler was not reached until the 1960s, when the kinematics of plate motion was reliably quantified. In terms of understanding the dynamics we may today have reached the level of Huygens or Hooke, but the grand unifying theory of a Newton is still in the future.

The book is intended mainly for students of earth sciences at the advanced undergraduate to graduate level. For a person with a background in physics it should be relatively easy reading, although occasionally a glossary of geological terms would have been helpful. Despite my critical remarks, I highly recommend the book for physicists who are interested in exciting developments in a neighboring discipline. If one is a little careful not to take every detail as established beyond doubt, the book gives deep insights into how the machinery of the apparently solid earth works.

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Gateways into Electronics. Peter Carroll Dunn. 658 pp. Wiley, New York, 2000. Price: $89.95 ISBN 0-471-25448-7. (Joel Fajans, Reviewer.)

Here at U.C. Berkeley's Physics Department, our majors take a mandatory laboratory course on Electronics. While a few students enter the course knowing a good deal of electronics, most are barely familiar with a multimeter. And many, particularly the theoretically minded, find the course very difficult. Our course is based on an extensive lab manual,[1] supplemented by Horowitz and Hill's *The Art of Electronics*. Though slightly dated, Horowitz and Hill is the reference electronics text found in every experimental laboratory. Unfortunately, our students don't like it. Even after years of teaching the lab, I don't fully understand why, but it seems to be a startup problem. The refreshingly opinionated colloquial style of *The Art of Electronics* is extraordinarily useful to those of us who know electronics, but does not seem to help the students. They want a book that is more basic, has fewer digressions, and offers fewer choices. In other words, they want to be told exactly what they need to know and no more.

So we have been searching for another book. Unfortunately, Peter Carroll Dunn's *Gateways into Electronics* is not what we've been looking for. Dunn states in the preface that the book is intended to be used in an introductory course, but it is rather dry and theoretical. The first two chapters, for instance, give a fairly sophisticated treatment of linear theory, convolutions, and transforms. Something as simple as a potentiometer isn't mentioned until page 118. Because the book includes laboratory exercises, I would assume that it is intended to be used in a course with an accompanying laboratory. The first laboratory exercise begins:

> Using enameled copper wire of diameter 1 mm (18 AG), wind a 50-turn solenoid on a wood or Lucite cylinder of radius 25 mm. Use (Eq.) (3–4) to estimate that $L=100\,\mu$H. Obtain also that the resistance r of the solenoid is 0.17 Ω ...Run a 1 A current through the solenoid and measure the voltage to obtain r.

This is actually a wonderful exercise, and if our students were capable of following it, I'd be happy to assign it. But they wouldn't be able to do it: they wouldn't know what enameled copper wire looks like, they wouldn't know how to remove the enamel to make the contacts (most of them would not even realize that they would have to remove the enamel to make the contacts), they wouldn't know how to put 1 A through the coil, and they wouldn't know how to measure the voltage across the coil. This is not a book for an introductory laboratory course. I suspect it would not make a good book even for an introductory lecture course, as I doubt that a student would be motivated to understand things like the deep theory of two ports without first knowing how to use a multimeter to measure a resistance.

Gateways into Electronics might be a good book for a second-semester course. The author clearly tries (and often succeeds) at bringing complicated concepts down to earth. The book has thorough sections on transistors and the stability of op amps. It has an unusually complete section on noise, and uses the ideas developed in that section to discuss signal recovery from noise. I'd be most likely to use it as a reference when I need to delve into the subject.

[1]Our lab manual can be downloaded from http://socrates.berkeley.edu/~phylabs/bsc/index.html.

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BOOKS RECEIVED

The Amateur Astronomer (reprints from Scientific American). Edited by Shawn Carlson. 271 pp. Wiley, New York, 2001. Price: $16.95 (paper) ISBN 0-471-38282-5.

College Physics, 2nd ed. Paul Peter Urone. 893 pp. Brooks/Cole, Pacific Grove, CA, 2001. Price not given, ISBN 0-534-37688-6.

Five More Golden Rules: Knots, Codes, Chaos, and Other Great Theories of 20th-Century Mathematics. John L. Casti. 268 pp. Wiley, New York, 2000. Price: $16.95 (paper) ISBN 0-471-39528-5.

Flatterland: Like Flatland, Only More So. Ian Stewart. 294 pp. Perseus, Cambridge, MA, 2001. Price: $25.00 ISBN 0-7382-0442-0.

Inquiry Into Physics, 4th ed. Vern J. Ostdiek and Donald J. Bord. 504 pp. Brooks/Cole, Pacific Grove, CA, 2000. Price not given (paper); ISBN 0-534-37310-0.

Liquid Crystals: Experimental Study of Physical Properties and Phase