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The Oceanic Thermohaline Circulation—*An Introduction*, by Hendrik M. van Aken, 2007. Series Atmospheric and Oceanographic Sciences Library, Volume 39. Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, Germany. Hardcover, xvii + 176 pages, 153 illustrations. Price USD 129.00. ISBN 978-0-387-36637-1.

This book presents various aspects of the world ocean thermohaline circulation (THC), starting from its basic definition to experimental aspects of the THC studies, to its energetics and dynamics. Van Aken also presents some important mechanisms that drives the THC, i.e. the formation and vertical convection processes in some specific areas. Finally, the book addresses simple general circulation models for the oceans, as well as the THC pattern under past climate conditions. The author is consistent in keeping the mathematics as simple as possible, which will help students of different background to appreciate as much as possible the physics of the phenomenon.

The first chapter gives a rather complete definition of the THC, although it is not stressed that the Meridional Overturning Circulation (MOC) represents an interplay between the THC and the wind-driven currents. After introducing basic concepts such as water salinity, temperature, pressure gradients and geostrophic flow, the author introduces water-mass and tracer analysis. For each chapter, the discussion is based on actual data, and I think that this is the most important aspect of this book, i.e. the presentation and discussion of phenomena based on experimental data.

In Chapter 5, the deep circulation in the Southern, Indian and Pacific oceans is described in detail. In my opinion, the author here goes too much into details; that is, fortunately, not the case in the next chapter, which deals with the upper branch of the THC.

The chapter dealing with dense-water formation is mainly limited to polar areas, without mentioning that the open-ocean convection was first studied in detail in the Western Mediterranean. Van Aken does not stress either the importance of the presence of the intermediate salinity maximum for the vertical convection processes (see the salty water tongue of Mediterranean origin in the North Atlantic). In this chapter, the author goes again into too much detail regarding specific aspects (see, for example, the Norwegian Sea and the exchange between the Nordic seas and the North Atlantic Ocean).

The chapter presenting the MOC is done very well, with a balanced combination of experimental evidence and theory, without giving too many details. The subsequent chapter, dealing with the THC energetics, is rather important, and is well done. Models of the THC are presented with the objective of further explaining the THC phenomenology without, however, entering into more details; Van Aken emphasizes that he wants to make the book accessible to students with highly varying mathematics backgrounds.

My conclusion is that the book represents a rather complete and well done evaluation of the THC; it can be used by students of different backgrounds, but they should be interested in oceanography. More specifically, it can be useful for M.Sc. and Ph.D. students in oceanography, and to a certain extent also for students in meteorology as an additional textbook. For the last-mentioned group, the book is important because of the interaction between atmospheric and oceanic global circulation, and because of the relationship with climate change. From a technical

point of view, some figures are not of the highest quality, but this is mainly due to the fact that they have been taken from original works or web sites.

It is difficult to compare the book with similar works, since relatively few works deal with this topic in a comparable way. I recommend the book warmly to oceanography graduate students.

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