

Postscript

These notes end (as do many courses) rather abruptly. I hope to leave the reader with the sense that he or she has learned a lot. But, I would hardly wish to disguise the fact that we have barely begun the exploration of atmospheric dynamics. The nonlinear evolution and possible equilibration of instabilities which should give us the wave and flux magnitudes has only been touched on – both in these notes and in current research. A major current approach to questions of the general circulation – namely, the use of large numerical computer simulations – has not even been discussed. Areas whose impact on large-scale dynamics is almost certainly major – like boundary layer turbulence and convective cloud activity – have likewise been only peripherally dealt with in these notes. Although we have come quite far in improving our understanding of many of the phenomena and features described in Chapter 5, we are still far from a satisfactory state, and, as we have earlier noted, there exists a world of important and challenging phenomena whose scales are smaller than those discussed in Chapter 5: hurricanes, fronts, thunderstorms, squalls, to name a few. Even those topics that we have dealt with in some detail have hardly been dealt with in any measure of completeness. Whole books (in most cases several) and countless articles have been devoted specifically to instability, wave theory, the general circulation, and even tides.

The sheer scope of problems which fall under the general rubric of atmospheric dynamics is so great as to lead, unfortunately, but inevitably, to a high degree of specialization. Certainly the individual problems are great enough to warrant focussed scrutiny – yet I hope that these notes have shown in a modest way how one problem often has important implications for other problems. Familiarity with topics beyond one's immediate interests is almost always helpful.

Finally, it must be clear by now that the likelihood that a reasonable number of graduate courses will serve to thoroughly cover atmospheric dy-

namics is highly unlikely. In this field, as in most others, learning must eventually transcend what is taught.