QUNADRY: all these cycles, but what to do with them? What you have now is a topologically invariant road map of the state space, with the chaotic region pinned down by a rigid skeleton, a tree of *cycles* (periodic orbits) of increasing lengths and self-similar structure. In chapter 18 we shall turn this topological dynamics into a multiplicative operation on the state space partitions by means of transition matrices of chapter 17, the simplest examples of evolution operators. This will enable us to *count* the distinct orbits, and in the process touch upon all the main themes of this book, going the whole distance from diagnosing chaotic dynamics to computing zeta functions.

1. Partition the state space and describe all allowed ways of getting from 'here' to 'there' by means of transition graphs (transition matrices). These generate the totality of admissible itineraries. (Chapter 17)

2. Learn to count (Chapter 18)

3. Learn how to measure what's important (Chapter 19)

4. Learn how to evolve the measure, compute averages (Chapter 20)

5. Learn what a 'Fourier transform' is for a nonlinear world, not a circle (Chapter 21),

6. and how the short-time / long-time duality is encoded by spectral determinant expression for evolution operator spectrum in terms of periodic orbits. (Chapter 22)

7. Learn how use short period cycles to describe chaotic world at times much beyond the Lyapunov time (Chapter 23).

Next ponder how symmetries simplify spectral determinants (chapter 24), develop some feeling for the traces of evolution operators (chapter 25), why all this works (chapter 26), when does it not work (chapter 27), what does it have to do with foundations of statistical mechanics (chapter 28) and turbulence (chapter 29).