VIII. Annotated Nomenclature Tables

The four tables in this chapter serve two purposes: taxonomy and documentation. Classification is a fundamental exercise in biology because it has important implications for how data is interpreted within a synthetic framework. There is certainly no general agreement on how to classify all of the various cell groups and fiber tracts in the brain. Over the course of the last 2,300 years, five different approaches have emerged (Swanson 2000b): dual brain (the oldest, formulated by Aristotle), segmental (originated by Vesalius in 1543), developmental (begun by Malpighi in the 17th century), evolutionary (due mostly to Edinger and Kappers), and genomic (the most recent).

Perhaps the most universal approach taken to CNS regionalization over the last century is based on the developmental scheme proposed by His (1895). The approach taken here is actually a variant of the segmental approach originating with Vesalius and Varolio (1573) and relies on a combination of embryonic and adult structural and functional criteria. Basically, the CNS is viewed as having three major parts: a cerebrospinal trunk consisting of brainstem and spinal cord, with cerebrum and cerebellum attached to the dorsal brainstem. The cerebrum and cerebellum each have cortical and nuclear divisions that may be further subdivided, and trunk cell groups have been arranged into parts related to the sensory, motor, behavioral state systems (Swanson 2000c, 2003a). A graphical comparison of the developmental scheme and the scheme adopted here is presented in Figure 11.

Table A is brief and presents systematically the major parts of the mammalian nervous system in general. *Tables B* and *C* arrange all of the cell groups and fiber systems, respectively, of the rat CNS shown in the atlas, in a basic format that has been found useful for summarizing the results of global histochemical mapping studies (see Arriza et al. 1988; Wada et al. 1989). *Table D* outlines the gross anatomical features of the rat peripheral nervous system (PNS). Because this book deals primarily with the brain, *Table D* is rather incomplete and emphasizes features associated with the atlas. More detailed accounts can be found in the references discussed in section II.

Documentation from the primary literature is an important feature of these tables. Thus, one or more key reference is given for each feature listed in *Tables B* and *C*, and brief discussion of difficult points is provided where deemed useful. The references point to key studies in the neuroanatomical literature that indicate what architectonic, and sometimes connectional, criteria were used to delimit a particular structure. This is meant to provide a convenient entry to the literature; it certainly is not possible here to review critically all of the literature about each cell group. *Tables A* and *D* contain many traditional terms that are difficult to trace through the literature, and are not heavily annotated.

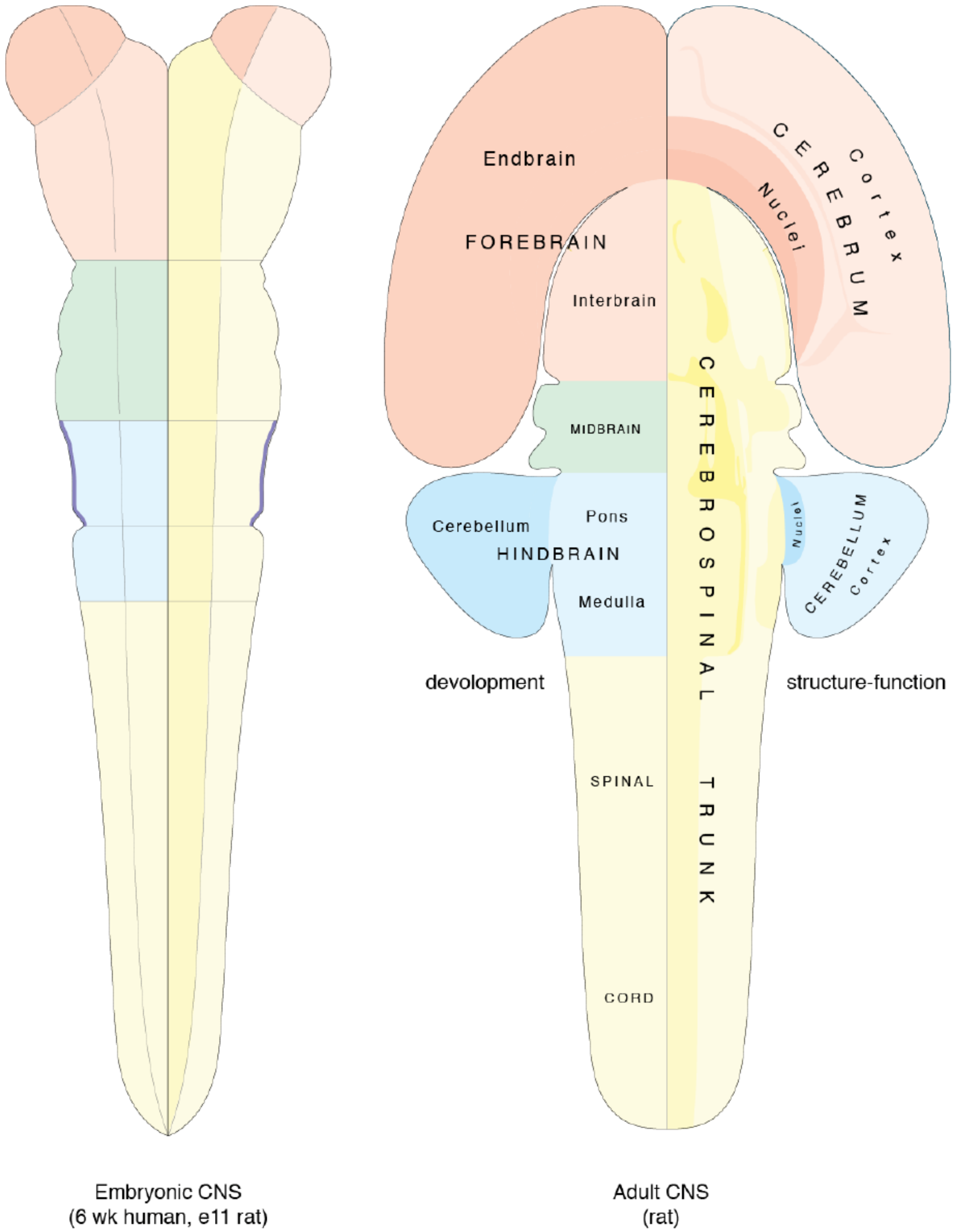

Fig. 11. This figure compares two different ways of viewing basic regionalization of the mammalian CNS in the early embryonic neural tube (left) and in a flatmap of the adult rat CNS (right). The left side of the embryonic neural tube and the adult flatmap show the developmental scheme of basic CNS parts that dates back to work on the chick embryo by Malpighi (1673). It is the basic scheme adapted in most neuroanatomy texts of the last century or so. The right side of the neural tube and adult flatmap contrasts this with the scheme adopted here, which is derived ultimately from the 16th century neuroanatomical work of Vesalius and Varolio. The cerebrum and cerebellum are attached to a cerebrospinal trunk, which in turn contains sensory, motor, and behavioral state systems.