

- B. **Migration**--(Fig. 3) The nuclei of young neurons generated in the matrix zone (A-H) migrate away from the ventricle by perikaryal translocation through their leading processes into the mantle zone, which thickens during the growth of the brain and spinal cord. (The matrix zone is also called the ventricular or germinal zone).

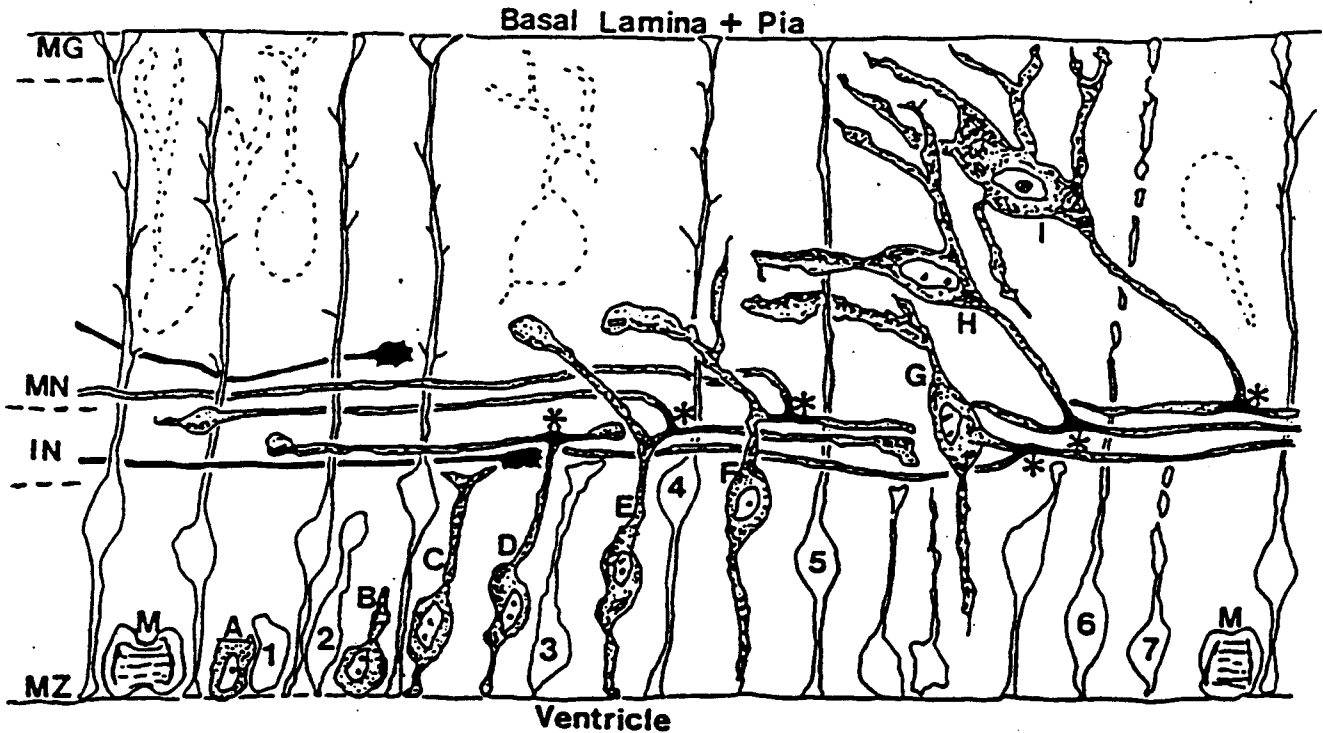


Fig. 3. Summary of Cellular Events in the Migration of Neuroblasts in the CNS (Book & Morest, J comp Neurol '90). The mantle zone (MN) contains differentiating post-migratory neuroblasts (dashed outlines) and the apical processes of primitive epithelial cells, processes that may retract or degenerate as cells re-enter the mitotic cycle. The intermediate layer (IN) forms at the interface between the mantle and matrix zones and contains efferent axons and afferent fibers with growth cones (black). The marginal zone (MG) consists of the end-feet and apical bifurcations of primitive epithelial cells. The matrix zone (MZ) (germinal or periventricular zone) contains primitive epithelial cell bodies (unshaded) (neuroepithelial cells), which are the precursors of neurons and neuroglia, engaged in the cell proliferation cycle. After mitosis (M) the daughter cells either return to the cell cycle (1-7) or migrate by elongation (B-E) and perikaryal translocation (E-H), followed by dendrite formation (H-I). *, axonal bifurcation at the site where the axon first grows out.

- C. **Differentiation**--The transformation of the postmitotic cell into a neuron (Fig. 3, H-I) includes increased nuclear volume, the appearance of rough endoplasmic reticulum (Nissl substance), the growth of processes (axons and dendrites), and the formation of synapses.
- D. **Cell death**--Nearly twice as many neurons form during development as survive, due to programmed cell death and failure to make appropriate connections.