$$\begin{array}{ccccc} a. & S & \rightarrow & NP\ VP \\ b. & NP & \rightarrow & (Det)\ N\ (PP) \\ c. & VP & \rightarrow & (Aux)\ V\ (NP)\ (AdvP)^n \\ d. & PP & \rightarrow & P\ NP \\ e. & AdvP & \rightarrow & \left\{\begin{matrix} Adv \\ PP \end{matrix}\right\} \end{array}$$