My Nucleosynthesis code uses a network of 271 nuclear reactions, most of them of the form i(j,k)l. In my code, the reaction n(p, γ)d is number (2). I've shown that Reaction (2) falls below the expansion rate at T =0.68 GK. At that temperature, deuterium is plentiful enough for rates that destroy deuterium to run in significant amounts. Figure (5) above shows the most prominent rates that create and destroy deuterium, numbered as they are in my code.

$$\begin{array}{rrcl} 2) & n+p & \rightarrow & d \\ 7) & {}^3He & \rightarrow & p+d \\ 10) & t & \rightarrow & n+d \\ 92) & n+2p & \rightarrow & p+d \end{array}$$

$$\begin{array}{rrcl} 2) & d & \rightarrow & n+p \\ 3) & d+d & \rightarrow & t+p \\ 4) & d+d & \rightarrow & n+\ {}^3He \\ 6) & d+t & \rightarrow & n+\ {}^4He \\ 7) & p+d & \rightarrow & {}^3He \\ 9) & d+\ {}^3He & \rightarrow & p+\ {}^4He \\ 10) & n+d & \rightarrow & t \\ 92) & p+d & \rightarrow & n+2d \end{array}$$

Reaction (2) is the only significant producer of deuterium. But because for deuterium $B =$ only 2.22 MeV many significant reactions exist that destroy deuterium. These reactions dominate after T = about 1 GK, and we see the mass fraction of deuterium decrease in Figure (3).

The reaction network fuses neutrons, protons, and deuterium into ^{3}He and tritium, and then fuses them into ^{4}He, ^{6}Li, ^{7}Li, and ^{7}Be, and then to heavier isotopes. So nucleosynthesis really begins at $T = 1$ GK, when there is enough deuterium to start building heavier isotopes from lighter ones. But ^{4}He has a $B = 28.3$ MeV. So Figure (6) shows that the rates that destroy ^{4}He are much weaker than the rates that produce it.

$$\begin{array}{rrcl} 6) & d+t & \rightarrow & n+\ {}^4He \\ 8) & p+t & \rightarrow & {}^4He \\ 9) & d+\ {}^3He & \rightarrow & p+\ {}^4He \\ 11) & n+\ {}^3He & \rightarrow & {}^4He \\ 13) & t+t & \rightarrow & 2n+\ {}^4He \\ 48) & d+d & \rightarrow & {}^4He \end{array}$$

$$\begin{array}{rrcl} 16) & {}^3He+\ {}^4He & \rightarrow & {}^7Be \\ 17) & t+\ {}^4He & \rightarrow & {}^7Li \\ 21) & d+\ {}^4He & \rightarrow & {}^6Li \\ 33) & {}^4He+\ {}^7Be & \rightarrow & {}^{11}C \\ 34) & {}^4He+\ {}^7Li & \rightarrow & {}^{11}B \end{array}$$

As a result as many baryons as possible go to ^{4}He nuclei. So all free neutrons present at $T =$ 1 GK become part of ^{4}He nuclei. Neutrons have a mass fraction X_n = around 0.125 at that temperature. So $X_{^4He}$ flattens out at 0.25 in Figure (3), and the total neutron-proton ratio flattens at 1/7 in Figure (1).