Passing the spaghetti

At a dinner party, there are N people seated around a table. A plate of spaghetti starts at the head of the table. The person sitting there takes some spaghetti and then passes the (very large) plate at random to his/her right or left. Henceforth each person receiving the plate takes some spaghetti and then passes the plate at random to his/her right or left. (Diners who have already received the plate can simply pass it on, without taking any more.) When all the diners have finally received their spaghetti, the plate stops being passed, and the eating begins.

(a) What are the chances of being the last to be served, as a function of position (relative to the head) at the table of N people?

(b) If this procedure is repeated over the course of many dinners, what is the average number of times the plate is passed?