MODULAR COCONUTS

Problem. *Five pirates are marooned on a tropical island that contains an enormous number of coconut trees. The pirates spend their first day gathering all of the coconuts that they can find and by nightfall have collected a giant pile of coconuts on the beach. Worn out from a long day of searching, the pirates all fall asleep after agreeing to divide the coconuts in the morning.*

After several hours, the first pirate wakes up. He doesn't trust any of the other pirates, so he decides to take his portion of the coconuts while the other pirates are sleeping. He divides the enormous pile into 5 equal piles and gives the single remaining coconut to a monkey that lives in the forest. After removing one of the piles to a secret hiding spot, he mixes the other four piles together into a (slightly less) enormous pile and goes back to sleep.

A little while later, a second pirate wakes up. He also doesn't trust any of the others, so he decides to take his portion of the coconuts while the other pirates are sleeping. He divides the (slightly less) enormous pile into 5 equal piles and gives the single remaining coconut to a monkey that lives in the forest. After removing one of the piles to a secret hiding spot, he mixes the other four piles together into a (less) enormous pile and goes back to sleep.

This continues throughout the night, with each of the remaining three pirates waking, dividing the coconuts into 5 piles, giving the leftover 1 to the monkey, and taking their selection before remixing the piles.

In the morning, the pirates meet at the (significantly reduced) pile of coconuts. After dividing the pile into 5 equal piles, there is a single leftover coconut for the (happy and fat) monkey. How many coconuts were in the original pile?