Math Diversion Problem 848

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> Talent is cheaper than table salt. What separates the
> talented individual from the successful one is
> a lot of hard work.
> — Stephen King

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Source: The Ether of Great Mathematical Ideas
Title: Divvying up the bowls of food
  Presenter:  Patrick
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1 Word Problem

How many people N can eat a meal containing soup, salad, and spaghetti, given the following constraints:

1. All of the food will be served from from 55 bowls, each containing exactly one of soup, salad, or spaghetti.
2. Each person gets his or her own bowl of soup.
3. When the people are paired off, each pair gets only one bowl of spaghetti.
4. When the people are tripled off, each triple gets only one bowl of salad.

2 Solution

Every one of the 55 bowls will contain exactly one of soup, salad, or spaghetti. Therefore,

$$55 \text{ bowls} = (\text{bowls of soup}) + (\text{bowls of spaghetti}) + (\text{bowls of salad})\,. \tag{1}$$

Substituting into this, we get

$$55 \text{ bowls} = N + \frac{1}{2}\,N + \frac{1}{3}\,N\,, \tag{2}$$

which has solution $N = 30$.