1. On the Road

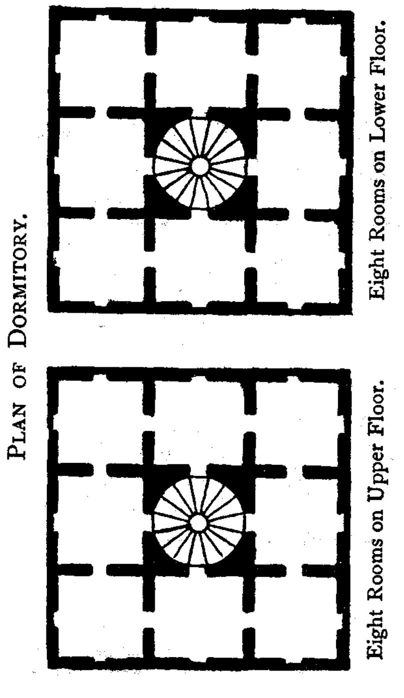
On my way to Wye, I pass five mileposts that indicate their respective distances to Wye. The mileposts are at fixed intervals. What's curious is that each milepost has a two-digit number, and together the five mileposts use all the digits from 0 to 9 once. What is the smallest distance that the closest milepost can be from Wye? Mileposts don't begin with 0.

2.The Riddle of the Pilgrims

The Abbott of Riddlewell announced that a messenger had that morning brought news that a number of pilgrims were on the road and would require their hospitality.

"You will put them," he said, "in the square dormitory that has two floors with eight rooms on each floor. There must be eleven persons sleeping on each side of the building, and twice as many on the upper floor as the lower floor. Of course every room must be occupied, and you know my rule that not more than three persons may occupy the same room."

I give a plan of the two floors, from which it will be seen that the sixteen rooms are approached by a well staircase in the centre.



After the monks had solved this little problem of accomodation, the pilgrims arrived, when it was found that they were three more in number than was at first stated. This necessitated a reconsideration of the question, but the wily monks succeeded in getting over the new difficulty without breaking the Abbott's rules.

The curious point of this puzzle is to discover the total number of pilgrims.

ECLiPSe Programming Competition

The Crowded Chessboard

You are given a chessboard together with 8 queens, 8 rooks, 14 bishops, and 21 knights. The puzzle is to arrange the 51 pieces on the chessboard so that no queen shall attack another queen, no rook attack another rook, no bishop attack another bishop, and no knight attack another knight. No notice is to be taken of the intervention of pieces of another type from that under consideration - that is, two queens will be considered to attack one another although there may be, say, a rook, a bishop, and a knight between them. It is not difficult to dispose of each type of piece seperately; the difficulty comes in when you have to find room for all the arrangements on the board simultaneously.

Masterclass

How many distinct solutions are there to the problem?

It is trivially not possible to place more than 8 queens, 8 rooks or 14 bishops (Why?). What is the largest number of knights that can be placed on the board without attacking each other? What is the largest number, given that the other pieces must be placed as well?