Rational harmonies in three voices, preferably for three flutes, or solo harp. Score € (Euros) 13.

Thomas Penyngton Kirkman (1806-1895)

In 1847 Reverend Thomas Penyngton Kirkman, an English pastor who was also an amateur mathematician, proposed several solutions to this problem:

Fifteen young ladies in a school walk out three abreast for seven days in succession; it is required to arrange them daily so that no two shall walk twice abreast.

(Ladies and Gentleman's Diary, Query VI, p.48)

His work can be considered the first “block design,” a subject that was to become a serious study in combinatorial mathematics. Of course, the discussion quickly grew to include all sorts of investigations of the possible combinations of sub-groups within larger groups, and even the original 15-ladies problem did not end with Kirkman, as mathematicians began to wonder whether it would be possible for the ladies to continue their daily walks for a complete semester of 13 weeks, so as to include all 455 possible three-lady combinations, once each. It was not until 1974 that R. H. F. Denniston of the University of Leicester published a solution, probably the only one, and thanks to him, I can now give you the music. Each lady/note appears once in the daily phrases of five chords, each pair of ladies walks together once a week, and by the end of the 13 weeks, about 13 minutes in musical time, all 455 possible trios of women have passed by, as have the 455 chords that represent them. I am particularly indebted to Paul Denny, a computer scientist at the University of Auckland, whose correspondence helped me to find this information and to understand it.

I like to imagine my three-note chords played by three flutes, or as a harp solo, though an interpretation with three oboes, three strings or one vibraphone might also be just fine, and since the music is really only notes and numbers, I would not want to prevent one from playing it on the piano or with some other instruments. We should leave the chords in this register though, and always keep the ladies clean and pretty. It seems safe to assume that the sun is always shining - otherwise they would not be taking walks.