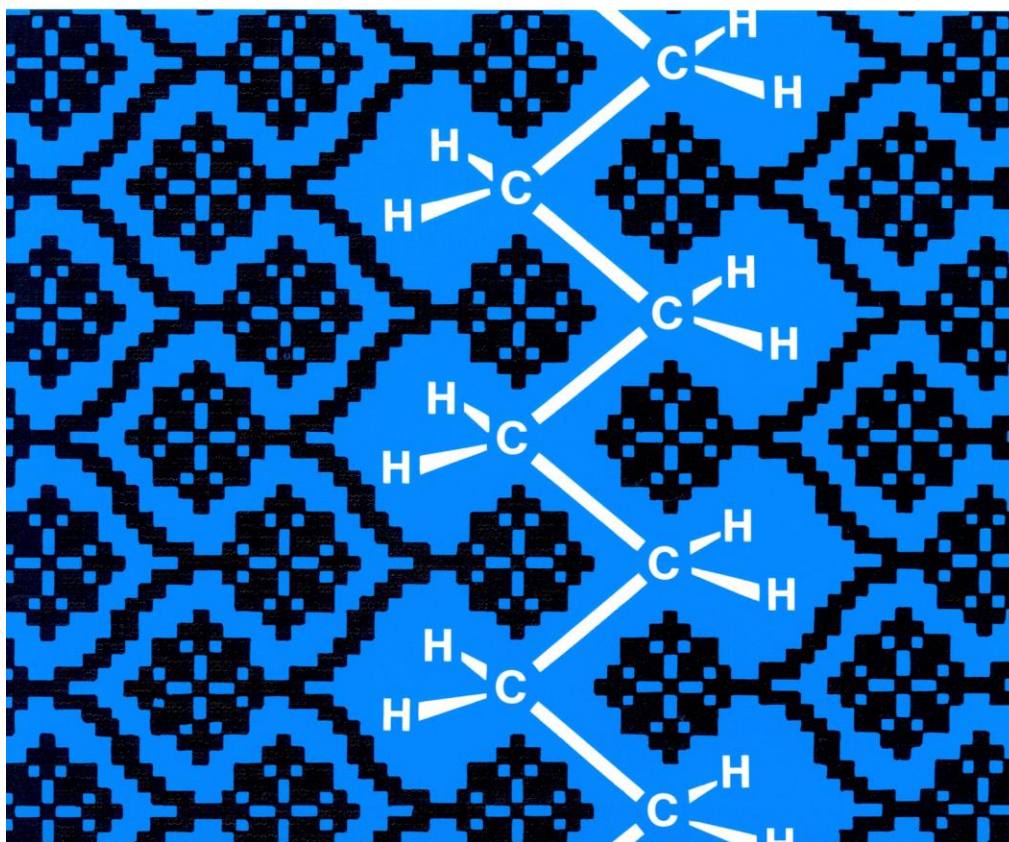


István Hargittai/Magdolna Hargittai

Symmetry through the Eyes of a Chemist



Cover of the first edition of *Symmetry through the Eyes of a Chemist*. The model of the polymeric molecule is embedded in the pattern of a pillow-slip decoration with scrolling stem motif, which was much used in Hungary around the (18/19) turn of the century.

The Seventeen Two-Dimensional Space-Group Symmetries in Hungarian Needlework^a

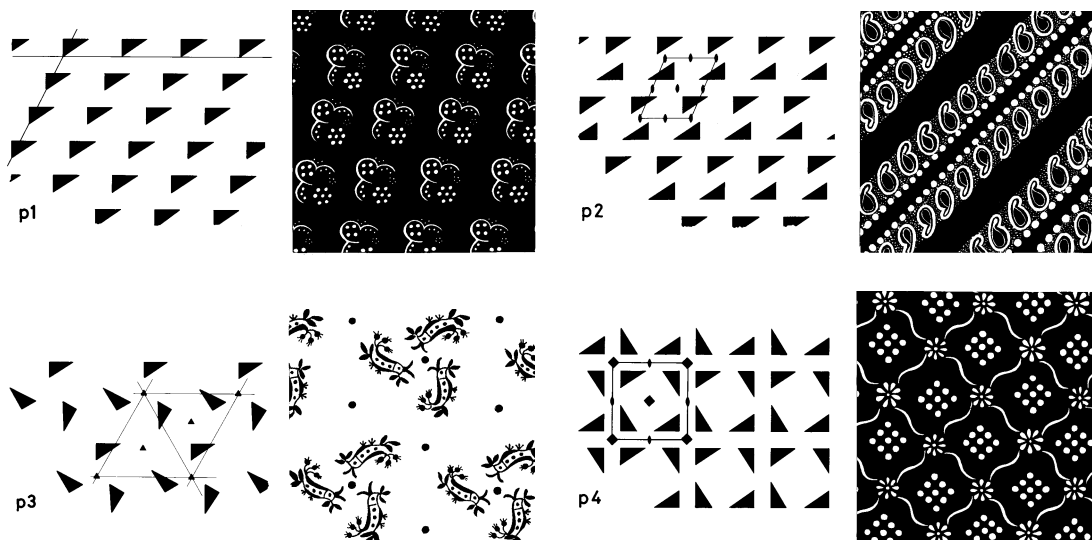
Istvan Hargittai and Gyorgyi Lengyel

We have recently demonstrated all seven one-dimensional space-group symmetries through examples found in Hungarian needlework [1]. The utility of these analogies is obvious in teaching crystallography and symmetry. Several colleagues have urged us to compile and communicate a similar system for the 17 two-dimensional space groups.

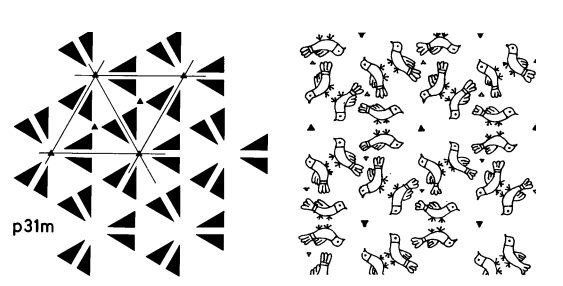
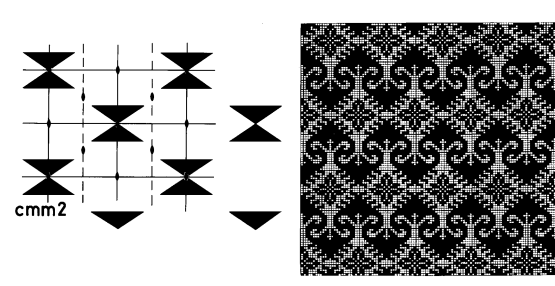
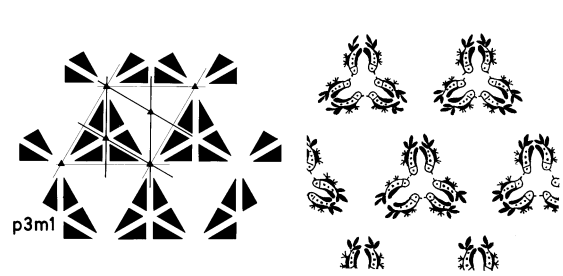
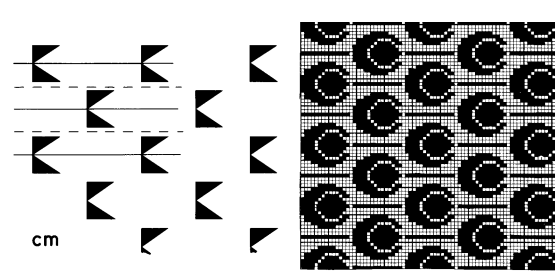
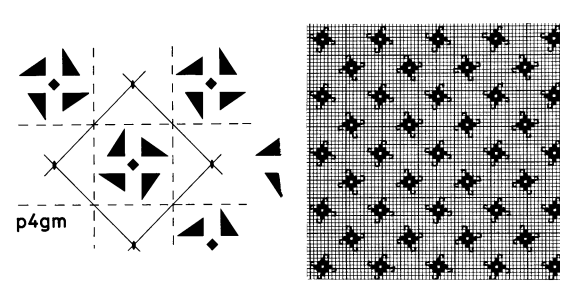
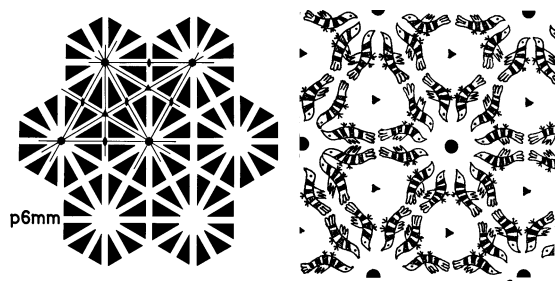
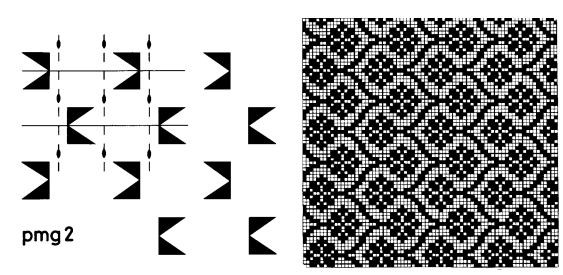
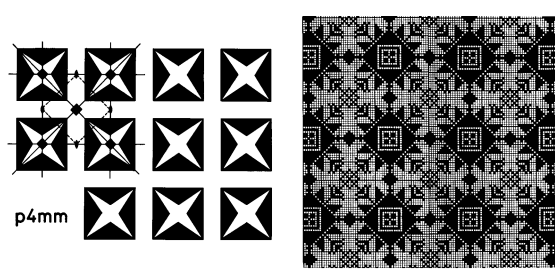
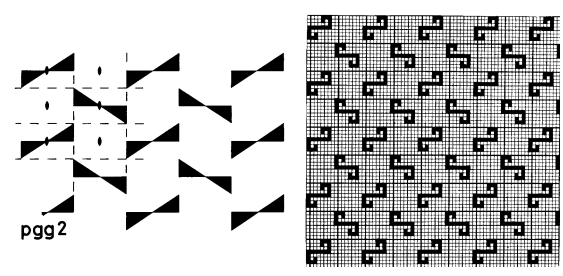
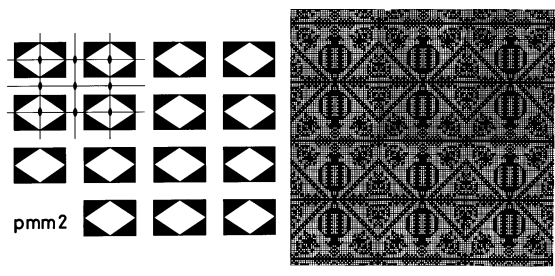
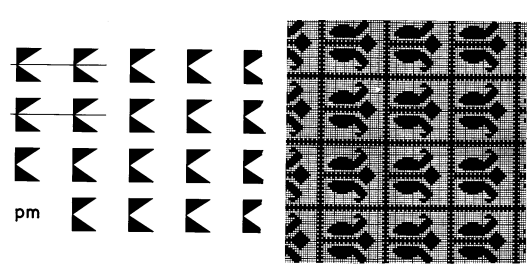
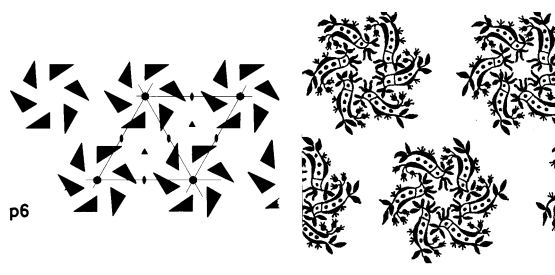
The two-dimensional space groups are more complex than the one-dimensional ones, but they are considerably also closer to the three-dimensional space-groups of the crystals. As is well known, there are 230 of the latter, but unfortunately no needlework analogies can be presented for them.

Seventeen Hungarian needlework are shown below together with corresponding systems of an asymmetric motif, the black triangle. Some of the most important symmetry elements are also indicated on them. More detailed descriptions can be found in books, including Buerger's classic, "Elementary Crystallography," [2] which has in some ways inspired the present work.

A brief description of the 17 pieces of needlework is given in the captions.



^a *Journal of Chemical Education* 1985, 62:35–36. Reproduced with permission © 1985 American Chemical Society



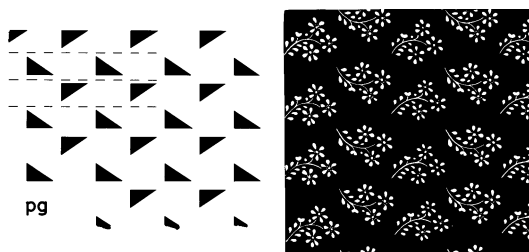


Figure in 17 parts:

p1 and p4: Patterns of indigo-dyed decorations on textiles for clothing. Sellye, Baranya County, 1899

p2: Indigo-dyed decoration with palmette motif for curtains. Currently very popular pattern

p3 and p6: Decorations with characteristic bird motifs from peasant vests. Northern Hungary

pm: Decoration with tulip motif for table-cloth. Cross-stitched needlework from the turn of the century

pmm2: Bed-sheet border decoration with pomegranate motif. Northwest Hungary, 19th century

p4mm: Pillow-slip decoration with stars. Cross-stitched needlework, Transylvania, 19th century

p6mm, p3m1, and p31m: Decorations with characteristic bird motifs from peasant vests. Northern Hungary

cm: Pillow-slip decoration with peacock tail motif. Cross-stitched needlework. Much used throughout Hungary around the turn of the century

cmm2: Bed-sheet border decoration with cockscomb motif. Cross-stitched needlework. Somogy County, 19th century

pg: From a pattern book of indigo-dyed decorations. Pápa, Veszprém County, 1856

pgg2: Children's bag decoration. Transylvania, turn of the century

pmg2: Pillow-slip decoration with scrolling stem motif. Much used throughout Hungary around the turn of the century

p4gm: Blouse-arm embroidery. Bács-Kiskun County, 19th century

References

1. Hargittai, I., and Lengyel, Gy., *J. Chem. Educ.*, 61, 1033 (1984).
2. Buerger, M.J., "Elementary Crystallography," Wiley, New York, 1963.