



Figure 5.52 The mapped coastline of southern Norway.

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er patterns by hand or use  
ania [9] under Suggested  
  
rns and wallpaper patterns  
s? Arrange the mirrors in  
nother. Place symmetric  
i the region between the  
  
e art of M. C. Escher. (See  
  
aving. (See Pizzuto [14].)  
wallpaper and classify  
pes of wallpaper patterns  
he reasons, including  
e the choice of symmetry  
  
ie art of various cultures.  
e variety of examples. For

- 7. Investigate tilings of the plane, which generalize wallpaper patterns. (See Grünbaum and Shephard [8].)
- 8. Investigate the symmetries of continuous (nondiscrete) frieze and wallpaper patterns. Try to classify types of such patterns.
- 9. In many cultures circular friezes appear as ornaments on cups and other cylindrical objects. Circular friezes replace the translations of friezes with rotations about a vertical axis. The seven frieze groups become seven subgroups of  $\overline{D}_n$ .
- a) Draw a frieze with symmetry group **pmm2** on a sheet of paper. Roll the paper into a cylinder to create a circular frieze. Describe how the symmetries of the frieze become symmetries of the circular frieze. Explain why this circular frieze has  $\overline{D}_n$  for its group of symmetries. What determines the value of  $n$  that a circular frieze has? Why do the symmetries of other circular