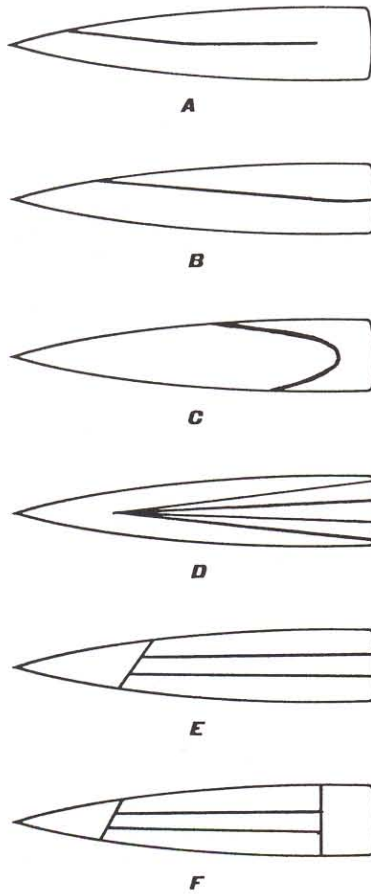


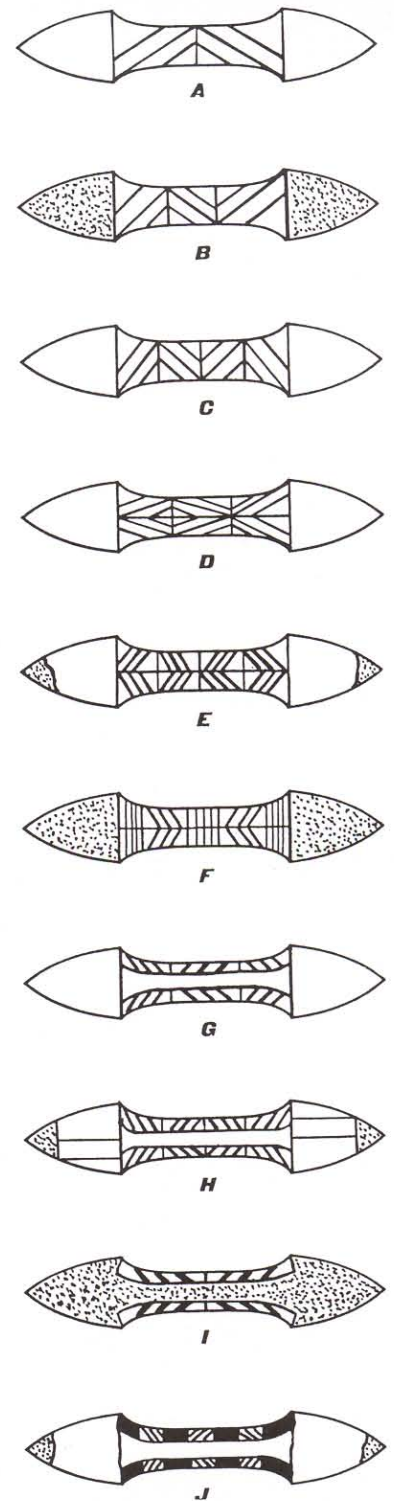
12 Cross sections of two-edged swords from the La Tène period (after Joachim Emmerling).

ing sharp blades but that this material could also break easily. Soft iron, on the other hand, could be readily bent and shaped - properties which, of course, made it quite unsuitable for swordmaking. The smith of



13 Cross sections of single-edged seax blades (after Joachim Emmerling).

the early Iron Age was faced with the task of producing a material which combined all the advantages of the hard and soft variants. This was a particularly difficult technical challenge which only a few exceptional smiths proved capable of meeting. In discovering the possibility of combining soft and hard steels, i.e. the invention of composite steel, lay one of the most important advancements of this early age. Over a long development period, generations of smiths succeeded in evolving a composite steel production technology to a remarkably high degree of technical proficiency. Investigations carried out on La Tène swords reveal that these were indeed of a quite complex structure. **Figure 12** shows a collection of sword cross sections from the La Tène period (500–100 BC; La Tène is the site of a Celtic settlement on the edge of Lake Neuchatel in Switzerland) as com-



14 Cross sections of early medieval damask sword blades (after Joachim Emmerling).

piled by Joachim Emmerling (Head of Restoration in Weimar, Germany). **Figure 13**