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## MetaPost arrowhead variants

Alan Braslau, Hans Hagen

Some colleagues have complained that the arrowheads in MetaPost graphics are too blunt, and that they would like to see a more stylish arrowhead. Perhaps they do not appreciate how MetaPost produces arrowheads that actually follow a curved path? Still, we realized that one can easily modify the arrowhead macro to produce variants to satisfy everyone while remaining simple and elegant.

We settled on a backwards-compatible solution of adding two new global, internal variables to the existing `ahlength` and `ahangle`: `ahvariant` and `ahdimple`. With the default `ahvariant:=0`, one gets the traditional MetaPost arrowhead. A non-zero value will give a more stylized arrowhead that uses the value of `ahdimple`, a unitless fraction of `ahlength`, by default 0.2, to create a dimple at the base. The `variant:=1` uses `...` to give a rounded dimple or “ear” and `variant:=2` uses `--` to create a barb. Finally, a sort of “broadhead” can be produced by making `ahdimple` negative. (We also made an efficiency change in PDF drawing that leads to an improvement when drawing arrowheads.)

This change is now part of MetaFun and ConTeXt and can be easily included as MetaPost macros. Examples follow (scaled for *TUGboat*).

```
pickup pencircle scaled 2mm;
ahlength := 8mm; drawarrow fullcircle scaled 2cm;
ahvariant := 1; drawarrow fullcircle scaled 4cm;
ahdimple := .5; drawarrow fullcircle scaled 6cm;
ahangle := 60; drawarrow fullcircle scaled 8cm;
```

