`callierr`: Visually Communicate Data in R using the Callier Center's Color Palette

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R graphics ecosystem

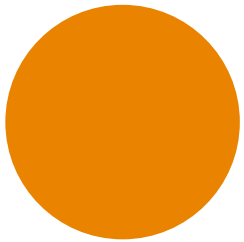
R a freely available language and environment for statistical computing and graphics (`https://cran.r-project.org`)

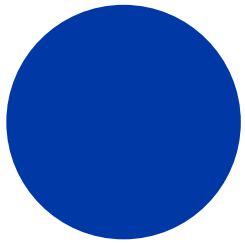
graphics the pre-installed base plotting system for R

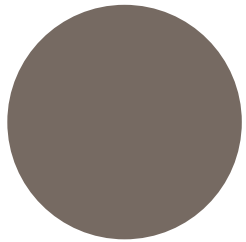
ggplot2 a plotting system for R based on the Grammar of Graphics (`http://ggplot2.org`)

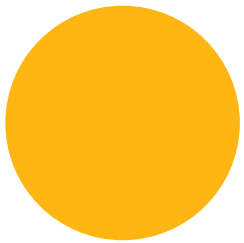
callierr an R package that provides color palettes and scales based on the Callier Center Brand Standards; integrates with `graphics` and `ggplot2` (`https://github.com/patrickreidy/callierr`)

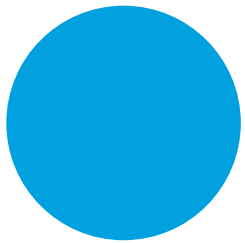
Callier Center color palette

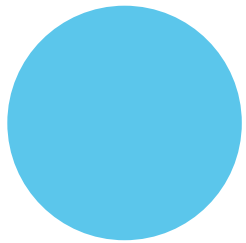

solar orange

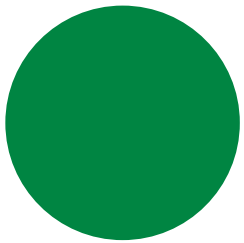

space blue

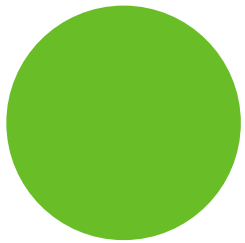

callier gray

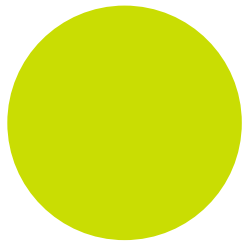

spark orange


stratos blue


sky blue

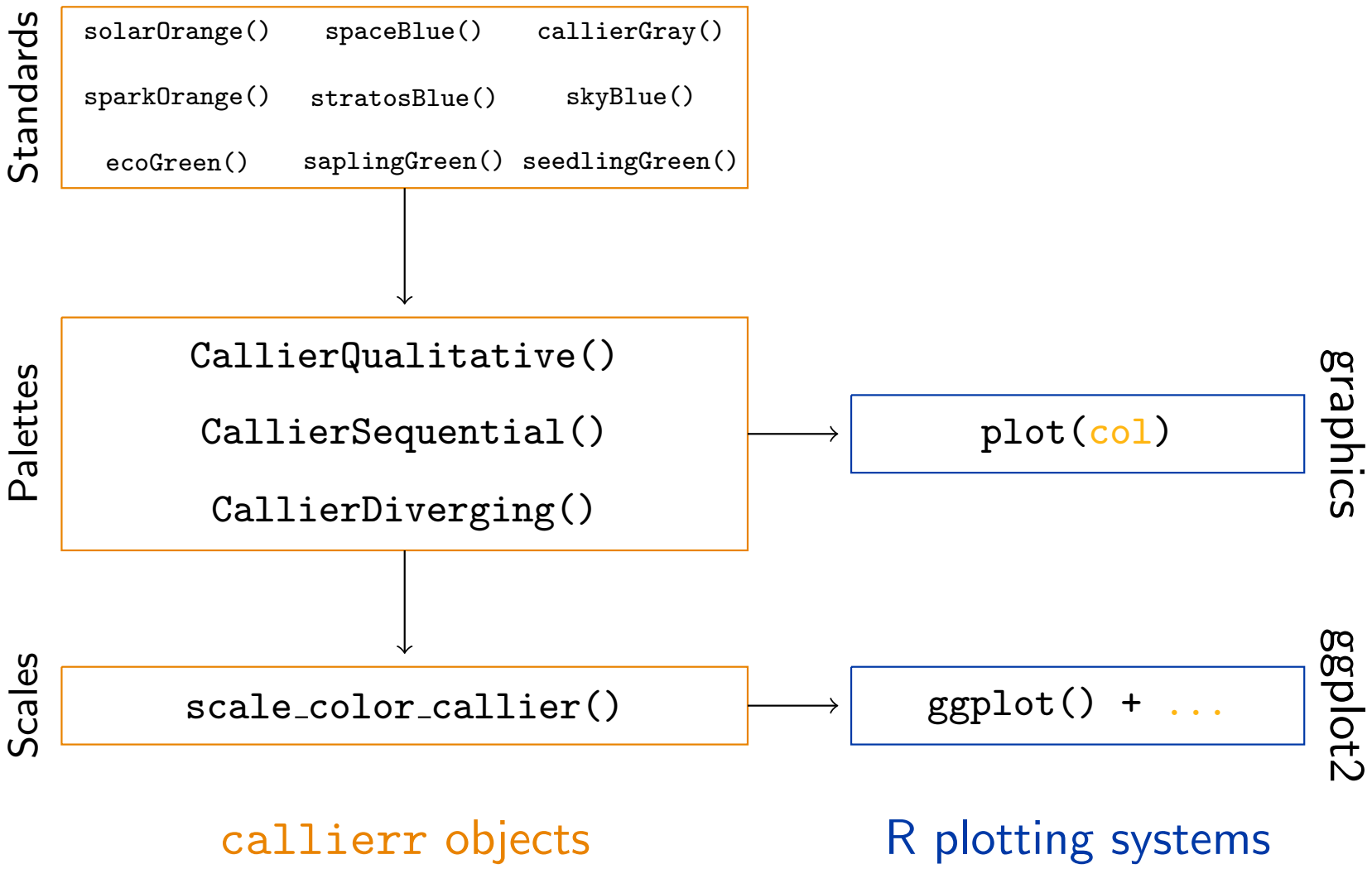

eco green


sapling green


seedling green

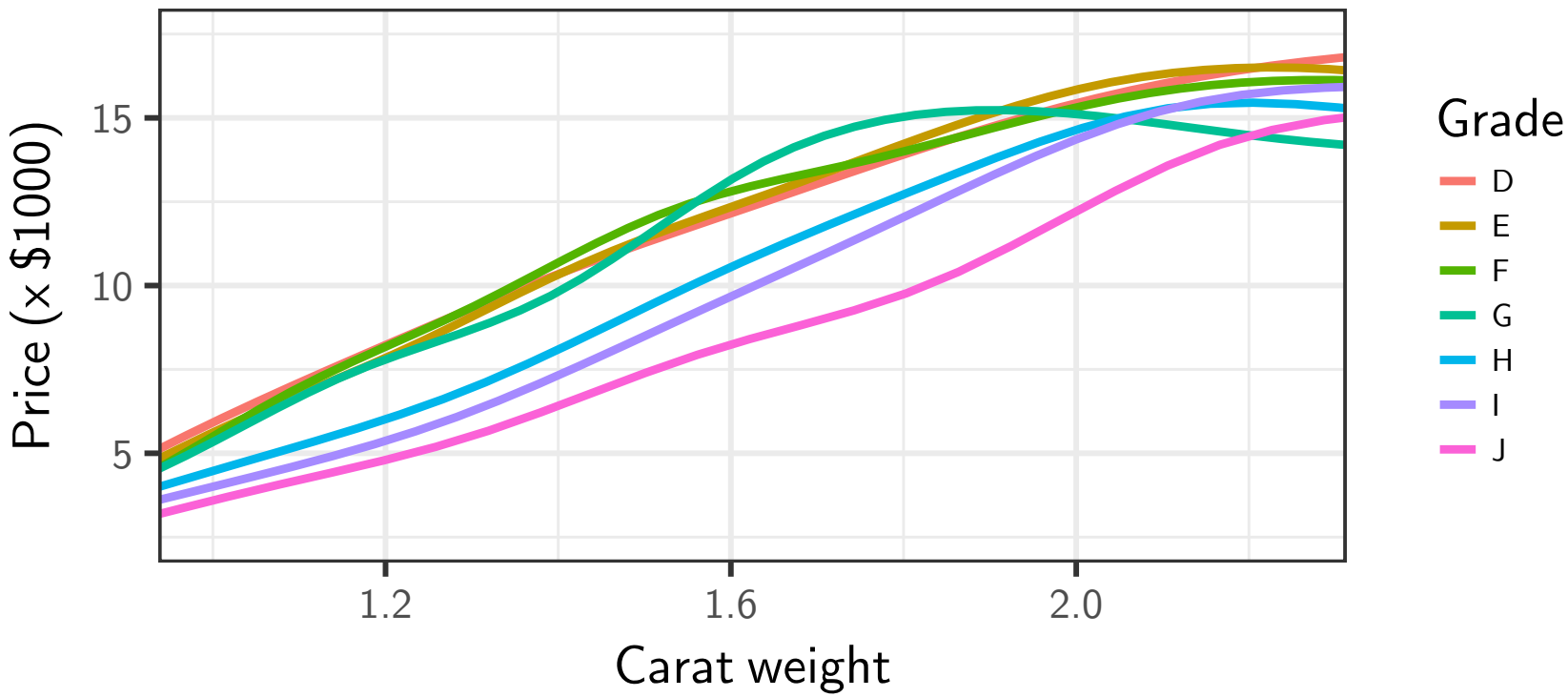
Callier Center color palette

callierr: Object hierarchy

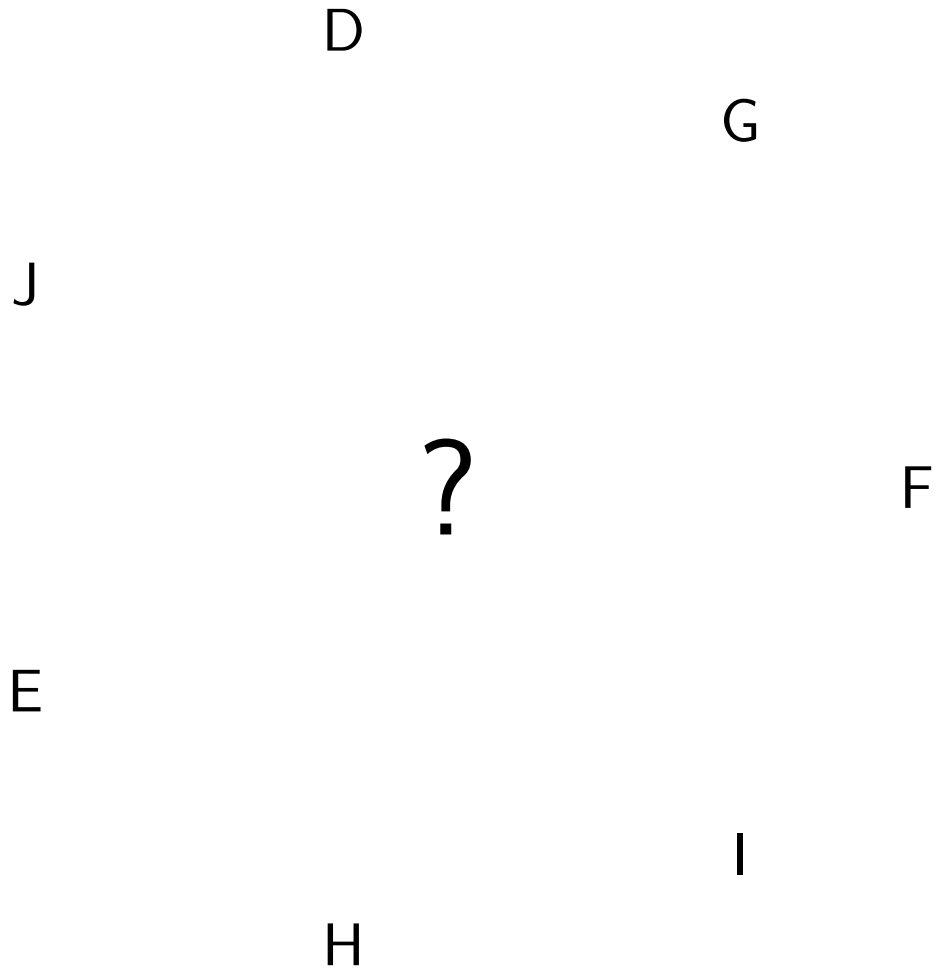


ggplot()'s default colors

```
1  base_plot <-
2    ggplot(data=diamonds,
3           aes(x=carat, y=price, color=color)) +
4    geom_smooth()
```

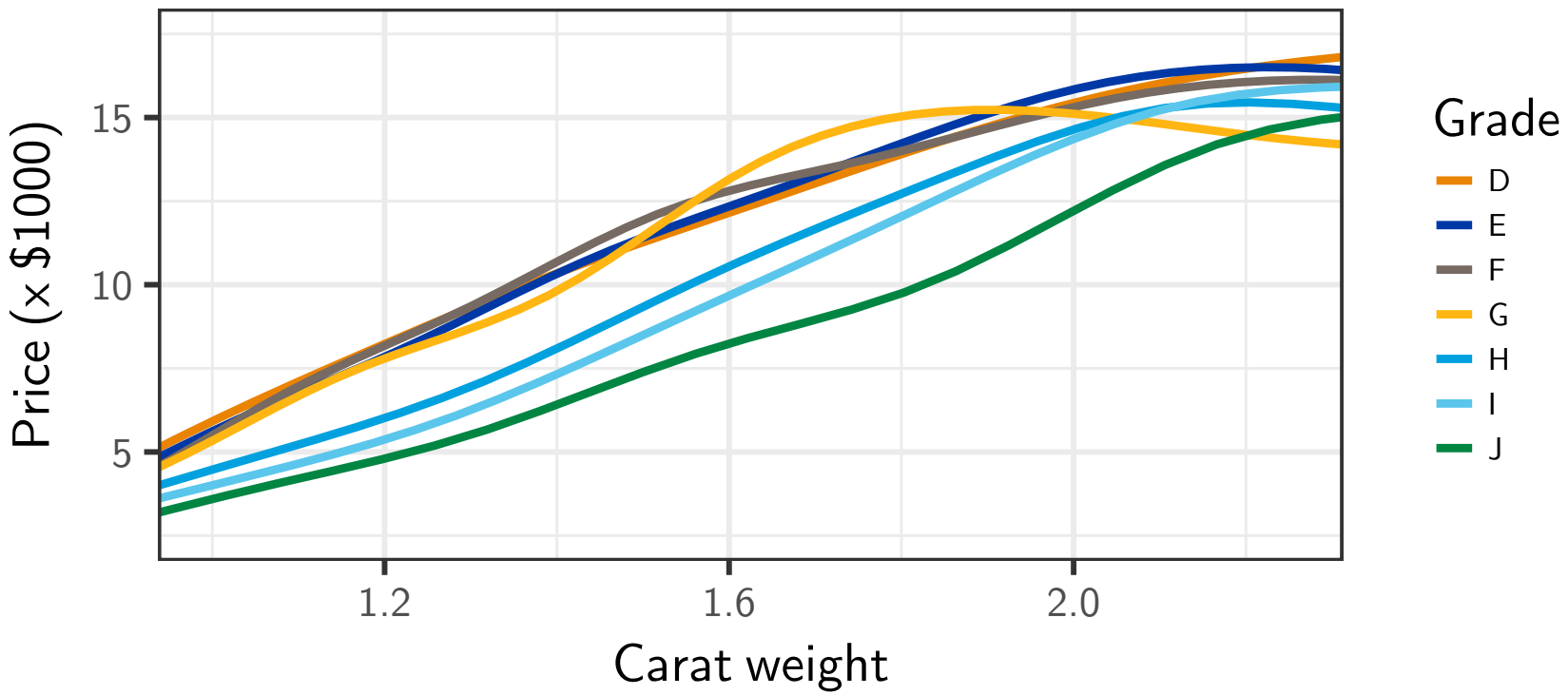


`callierr` in action: Qualitative scheme

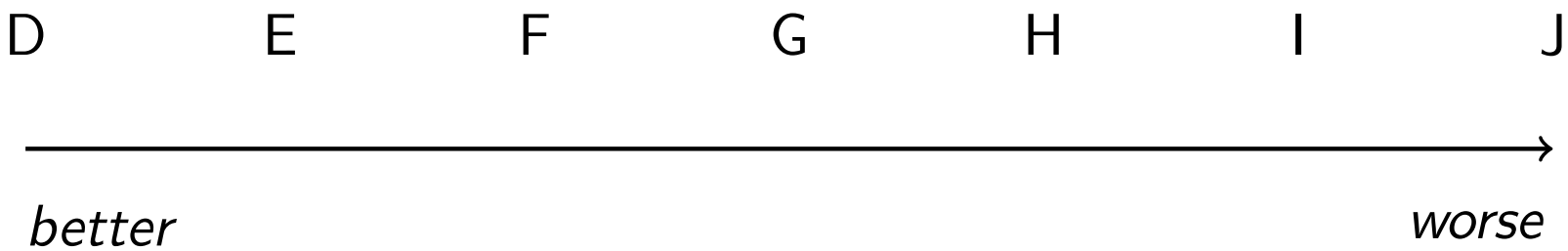


callierr in action: Qualitative scheme

```
base_plot +
  scale_color_callier(
    scheme = "qualitative", steps = 7)
```



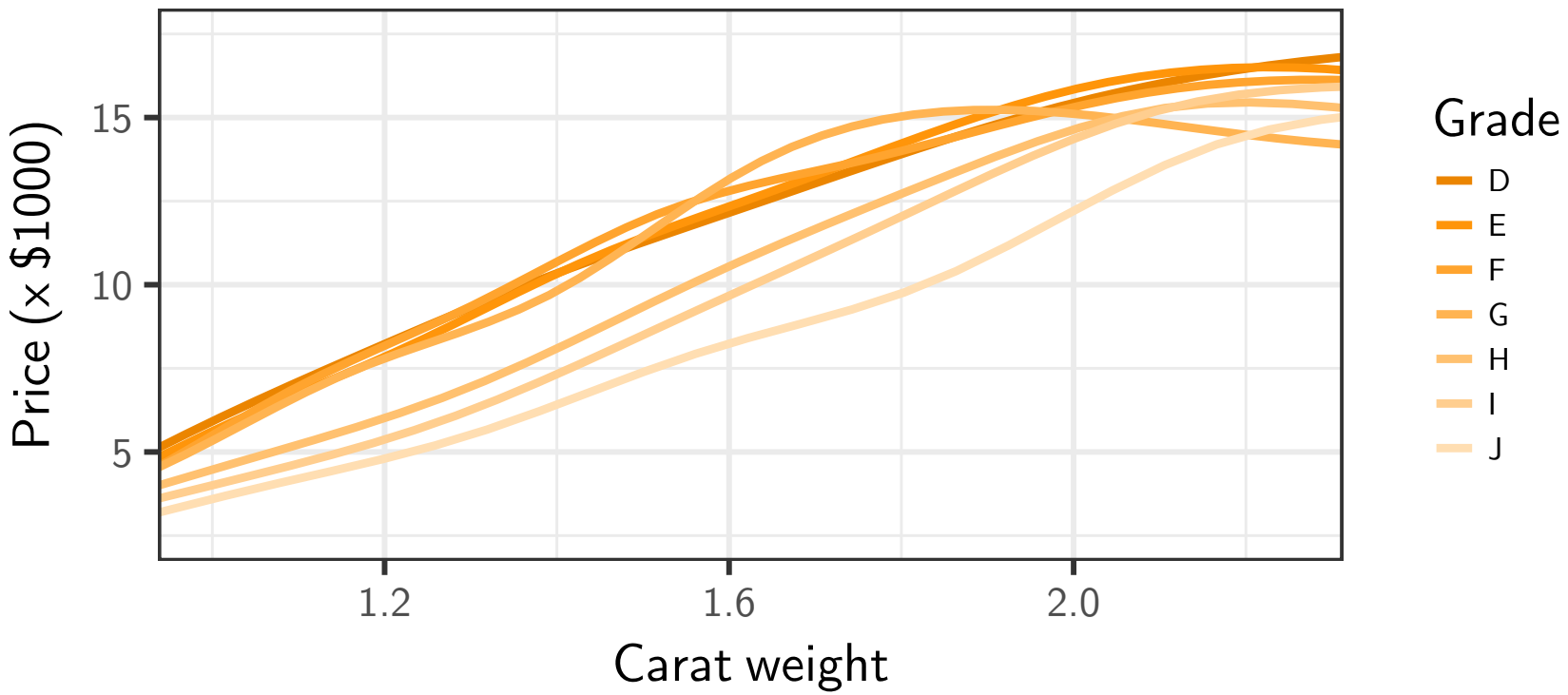
`callierr` in action: Sequential scheme



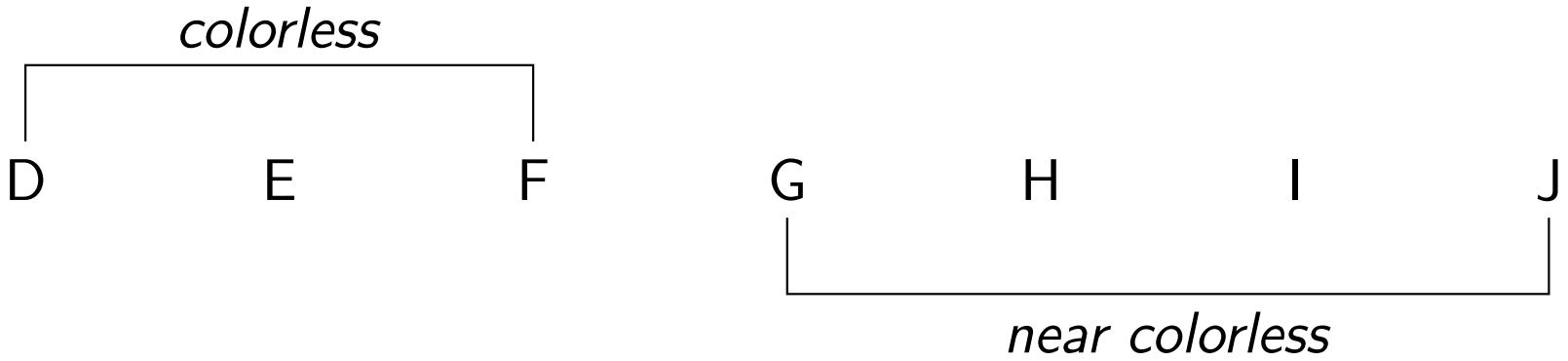
- Differences between levels = differences in luminosity

callierr in action: Sequential scheme

```
base_plot +
  scale_color_callier(
    scheme = "sequential", steps = 7,
    hue = "orange", direction = "decreasing")
```



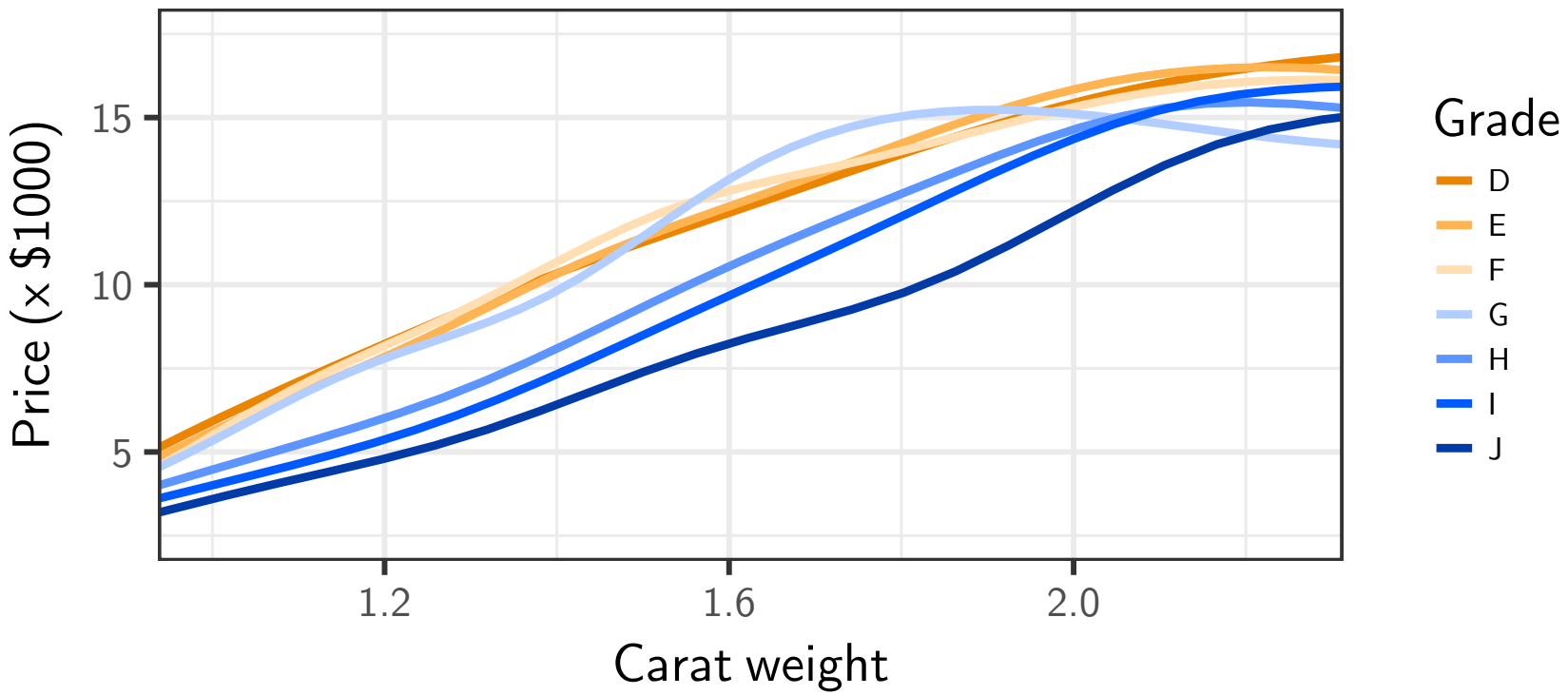
`callierr` in action: Diverging scheme



- Differences within a group = differences in luminosity
- Differences between groups = differences in hue

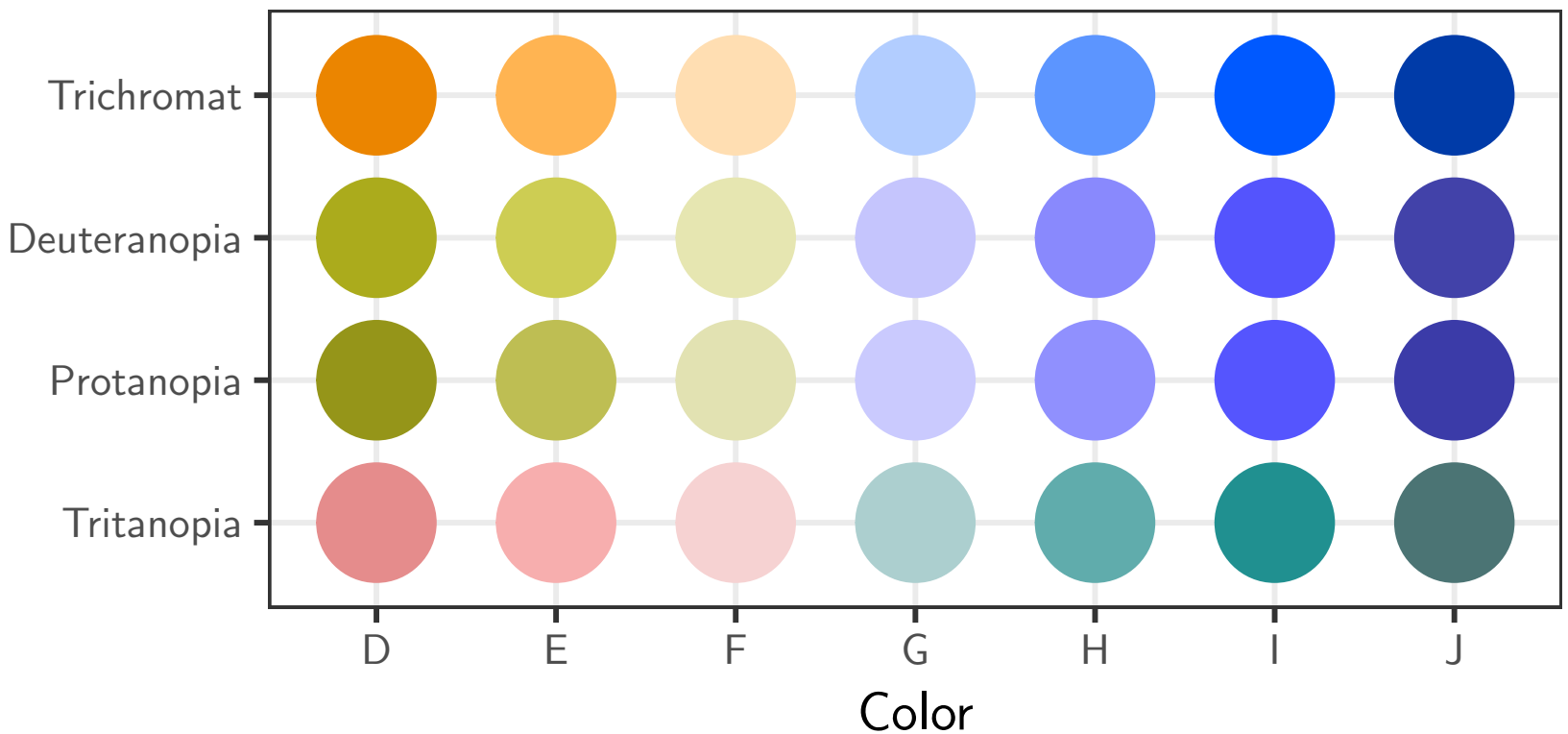
callierr in action: Diverging scheme

```
base_plot +
  scale_color_callier(
    scheme = "diverging",
    steps = list(orange = c("D", "E", "F"),
                 blue = c("G", "H", "I", "J")))
```



ColorChart(): Dichromats are people too

```
1   s <- list(orange = c("D", "E", "F"),
2             blue = c("G", "H", "I", "J"))
3   p <- CallierDiverging(steps = s)
4   ColorChart(palette = p)
```



Source directory organization for R packages

DESCRIPTION	Metadata
NAMESPACE	Export and import statements
R/	Code files (.R extension) where objects are defined
man/	Documentation files for the exported objects

Final thoughts

- Focus on the structure within data that you want to communicate
  Let `callierr` map that structure into a color scheme

- `callierr`'s code is open source; its license is copyleft
  - Contribute new functionality through Github
  - Adapt to other programming languages

- Future developments:
  - `ColorChart()`: accept scales, not just palettes
  - Diverging schemes: generalize beyond 1-d schemes